

Figure C.6-73. Alternate Berth diesel (ES-Alt-30K-d): Maximum mass (g/m²) of oil on the shoreline for the worst run to the islands along Santa Barbara Channel.

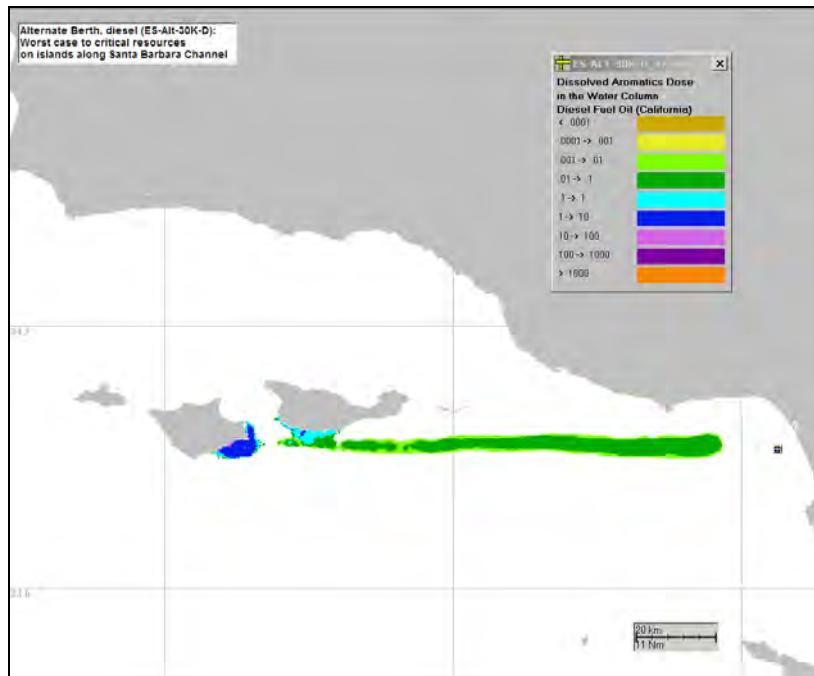


Figure C.6-74. Alternate Berth diesel (ES-Alt-30K-d): Dose (ppb-hrs) of dissolved aromatics in the water column for the worst run to the islands along Santa Barbara Channel.

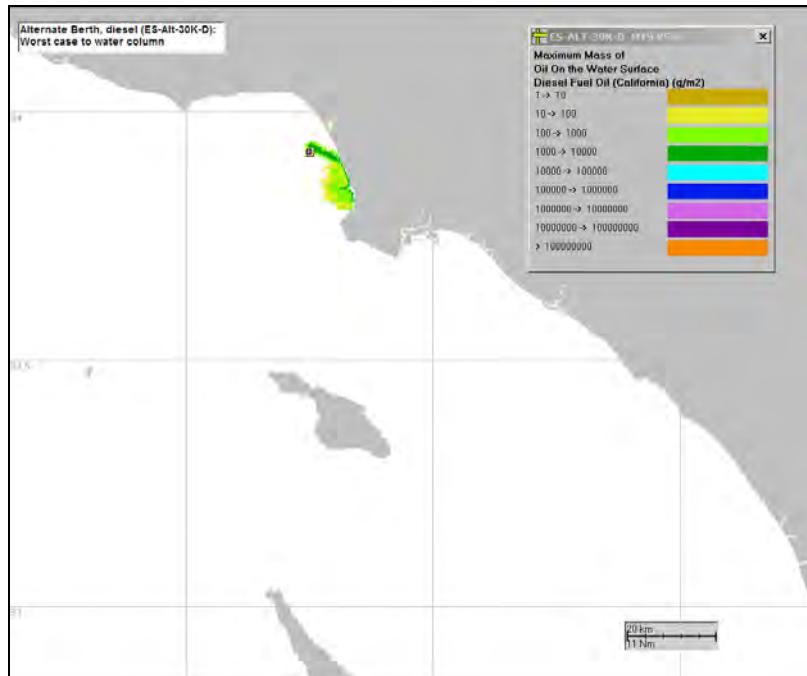


Figure C.6-75. Alternate Berth diesel (ES-Alt-30K-d): Maximum exposure at any time to floating oil (g/m^2) for the worst run to the water column.

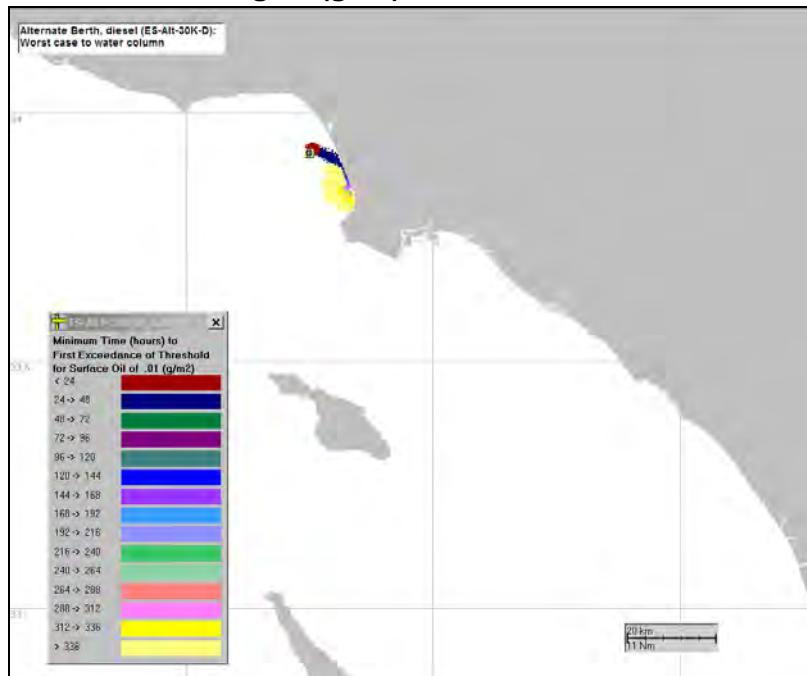


Figure C.6-76. Alternate Berth diesel (ES-Alt-30K-d): Minimum time to first exceed threshold for surface oil ($0.01 \text{ g}/\text{m}^2$) for the worst run to the water column.

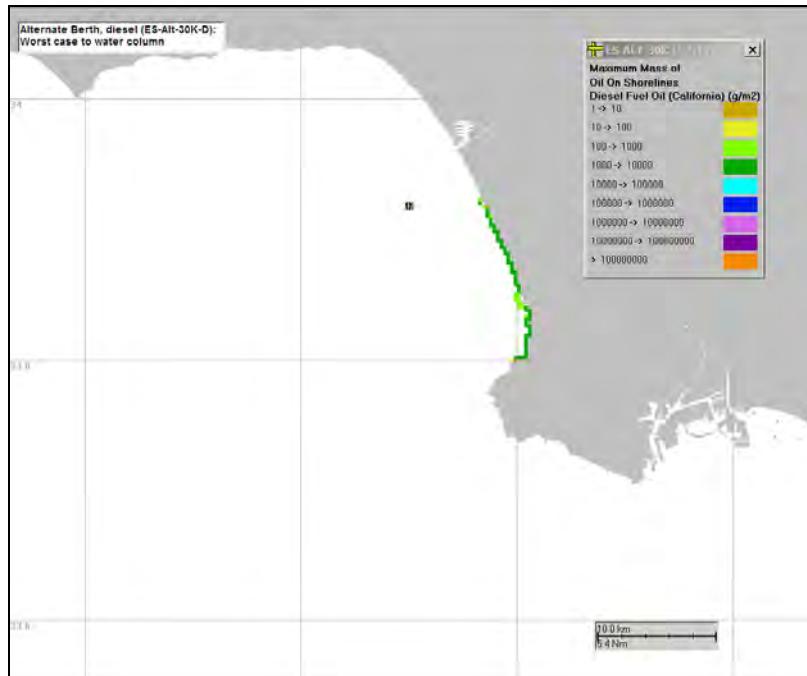


Figure C.6-77. Alternate Berth diesel (ES-Alt-30K-d): Maximum mass (g/m^2) of oil on the shoreline for the worst run to the water column.

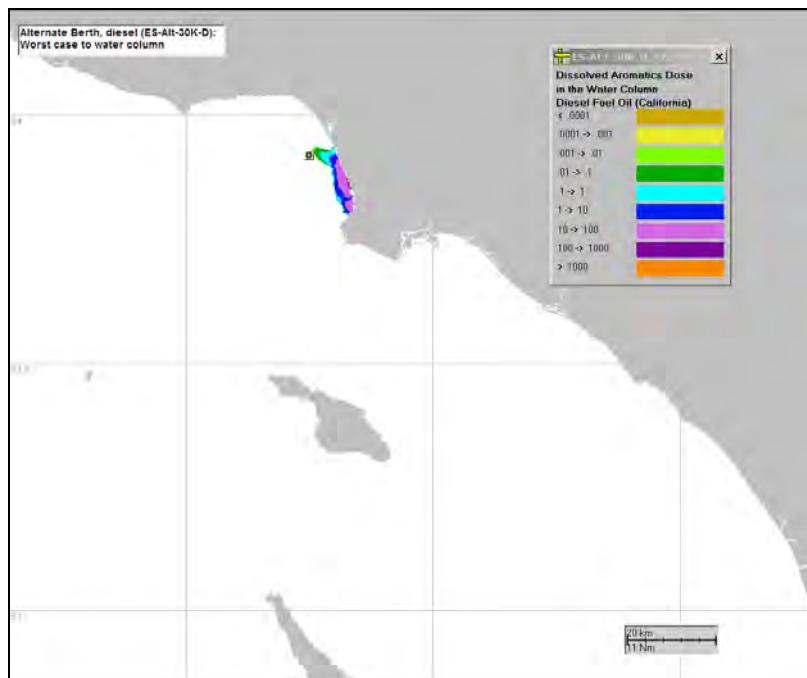


Figure C.6-78. Alternate Berth diesel (ES-Alt-30K-d): Dose (ppb-hrs) of dissolved aromatics in the water column for the worst run to the water column.

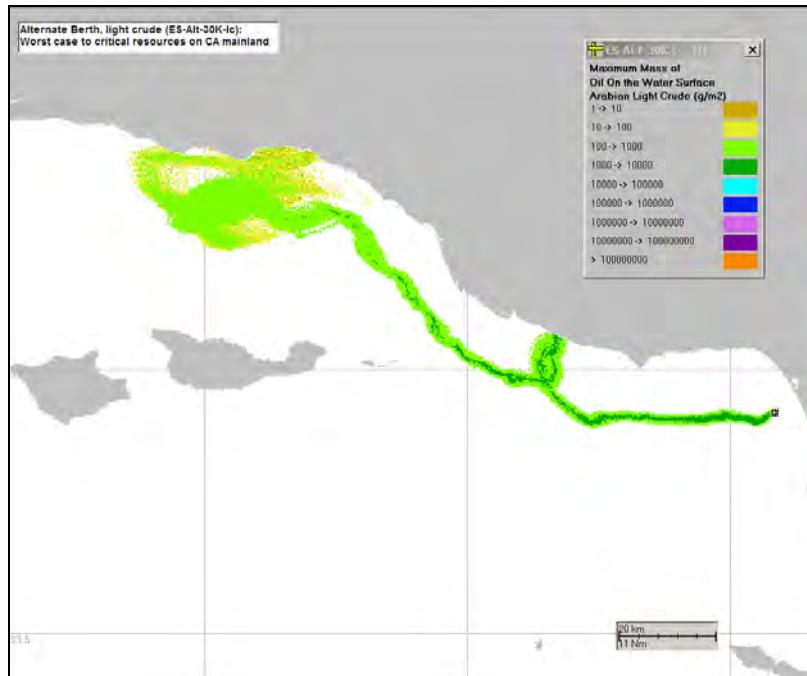


Figure C.6-79. Alternate Berth light crude (ES-Alt-30K-Ic): Maximum exposure at any time to floating oil (g/m^2) for the worst run to the California mainland shore.

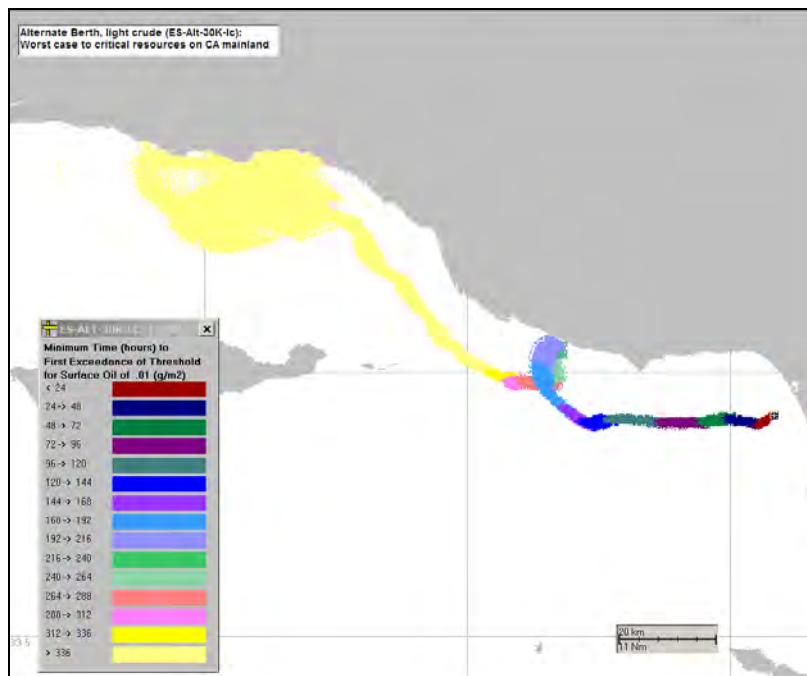


Figure C.6-80. Alternate Berth light crude (ES-Alt-30K-Ic): Minimum time to first exceed threshold for surface oil ($0.01 \text{ g}/\text{m}^2$) for the worst run to the California mainland shore.

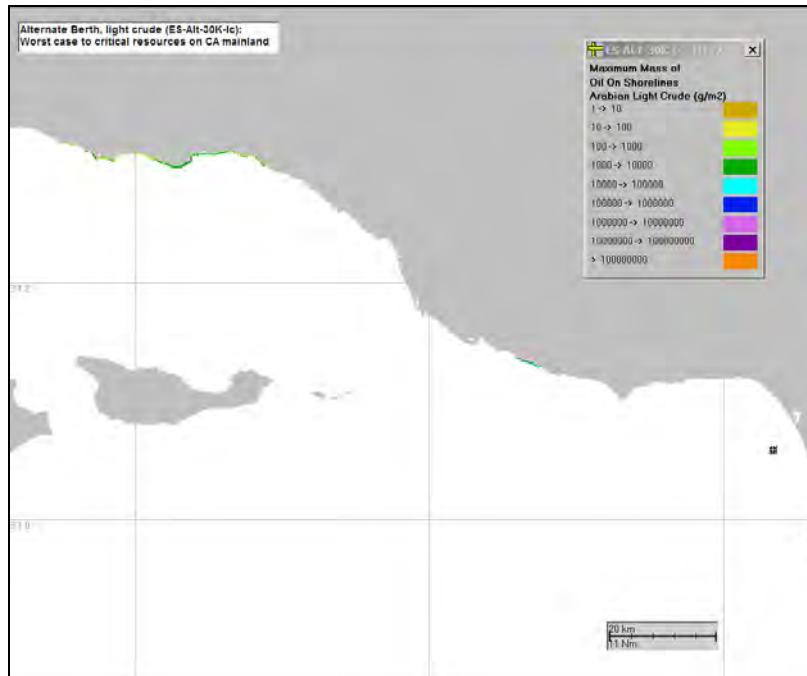


Figure C.6-81. Alternate Berth light crude (ES-Alt-30K-Ic): Maximum mass (g/m²) of oil on the shoreline for the worst run to the California mainland shore.

There were no significant concentrations of entrained oil or dissolved aromatics in the water column for this model run. Thus, water column exposure and impacts would be minimal.

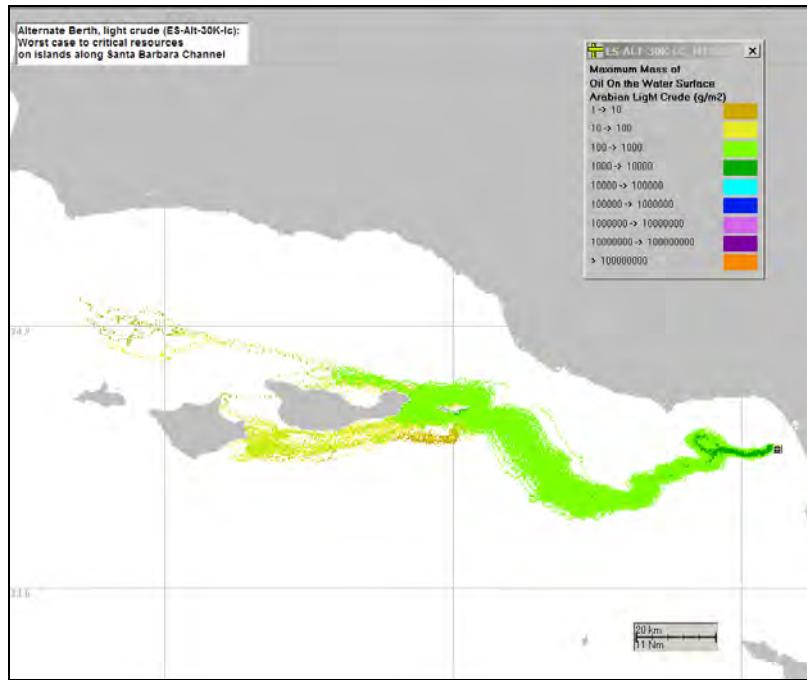


Figure C.6-82. Alternate Berth light crude (ES-Alt-30K-Ic): Maximum exposure at any time to floating oil (g/m^2) for the worst run to the islands along Santa Barbara Channel.

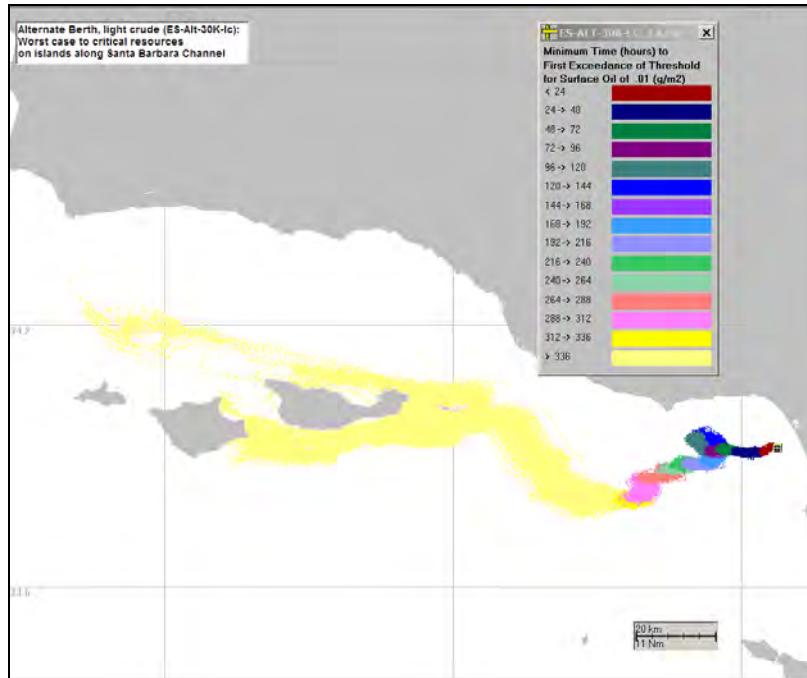


Figure C.6-83. Alternate Berth light crude (ES-Alt-30K-Ic): Minimum time to first exceed threshold for surface oil ($0.01 \text{ g}/\text{m}^2$) for the worst run to the islands along Santa Barbara Channel.

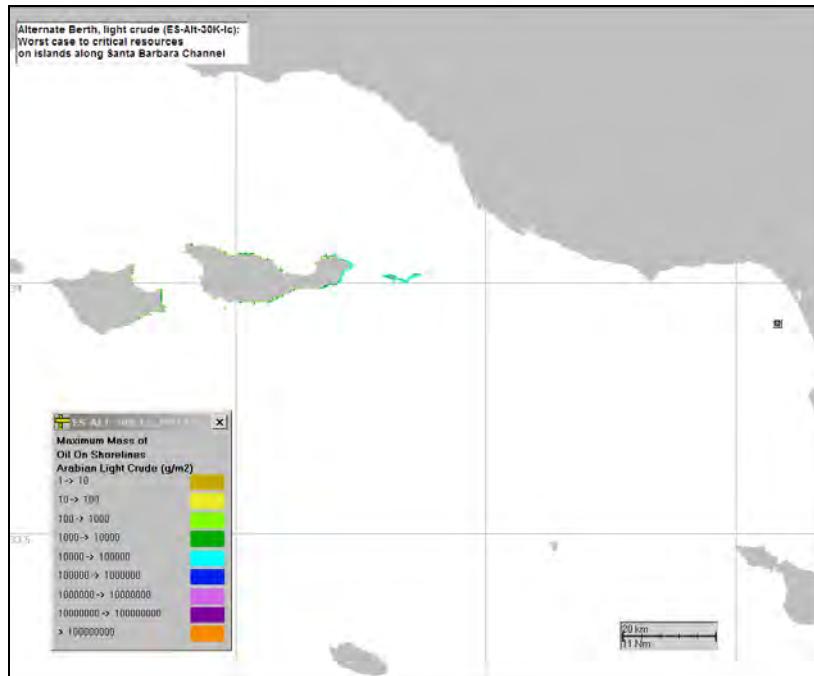


Figure C.6-84. Alternate Berth light crude (ES-Alt-30K-Ic): Maximum mass (g/m^2) of oil on the shoreline for the worst run to the islands along Santa Barbara Channel.

There were no significant concentrations of entrained oil or dissolved aromatics in the water column for this model run. Thus, water column exposure and impacts would be minimal.

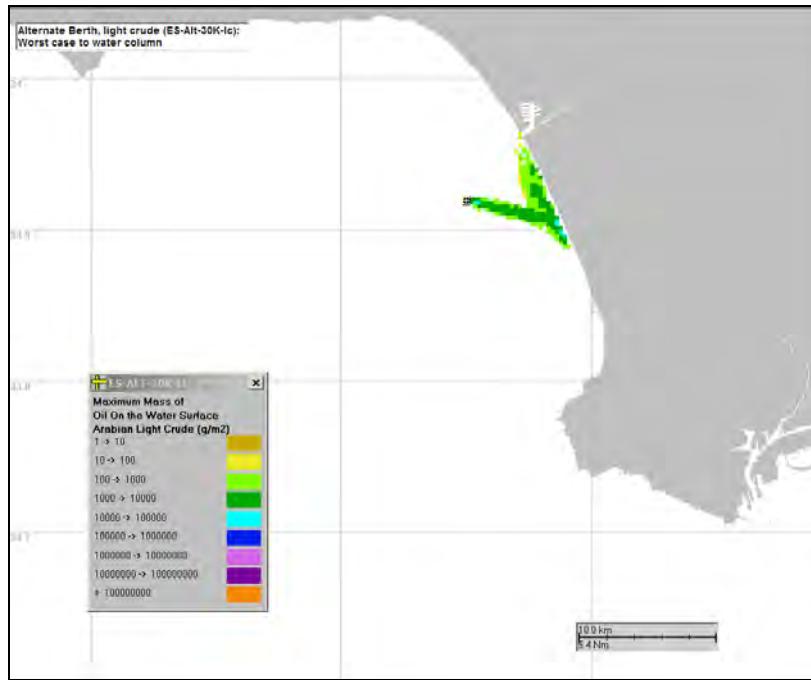


Figure C.6-85. Alternate Berth light crude (ES-Alt-30K-1c): Maximum exposure at any time to floating oil (g/m²) for the worst run to the water column.

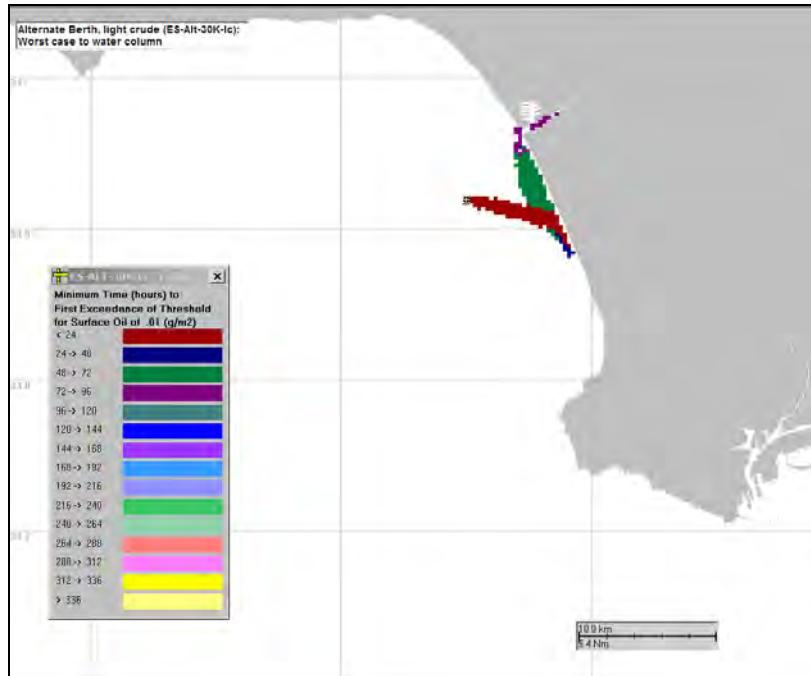


Figure C.6-86. Alternate Berth light crude (ES-Alt-30K-1c): Minimum time to first exceed threshold for surface oil (0.01 g/m²) for the worst run to the water column.

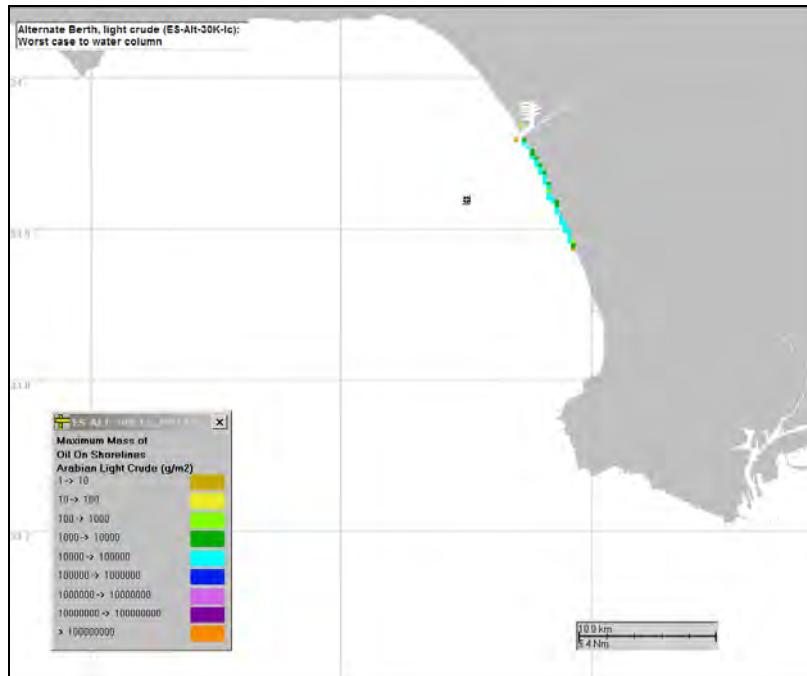


Figure C.6-87. Alternate Berth light crude (ES-Alt-30K-Ic): Maximum mass (g/m^2) of oil on the shoreline for the worst run to the water column.

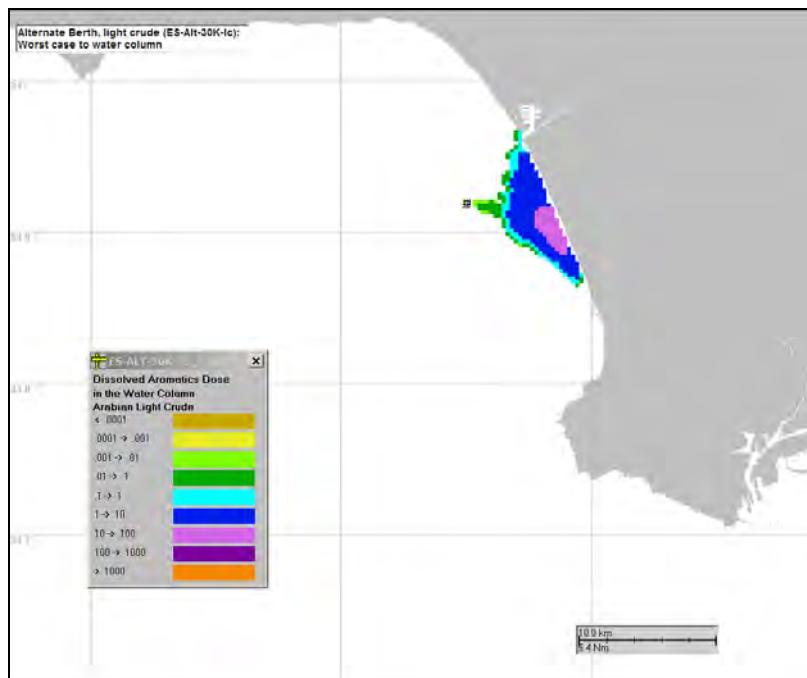


Figure C.6-88. Alternate Berth light crude (ES-Alt-30K-Ic): Dose (ppb-hrs) of dissolved aromatics in the water column for the worst run to the water column.

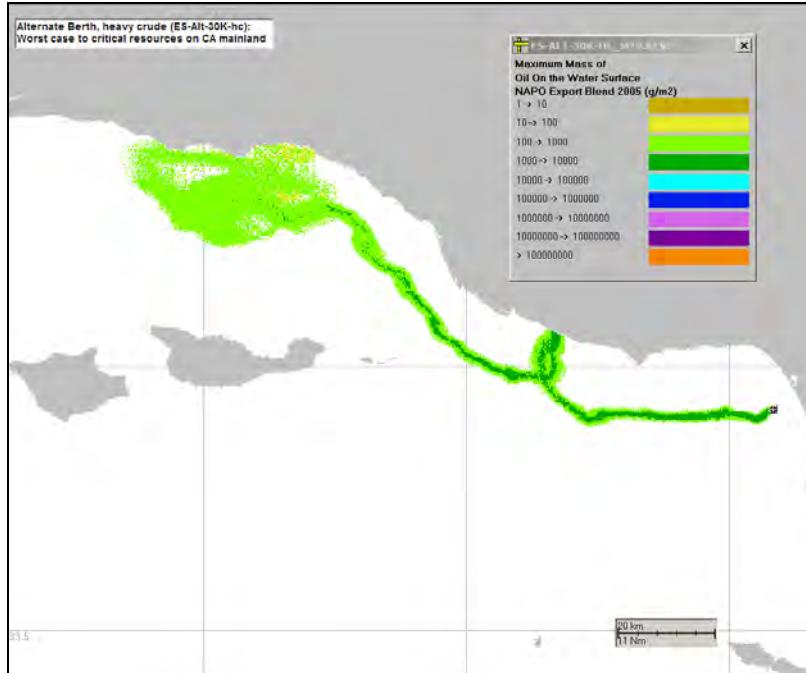


Figure C.6-89. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum exposure at any time to floating oil (g/m²) for the worst run to the California mainland shore.

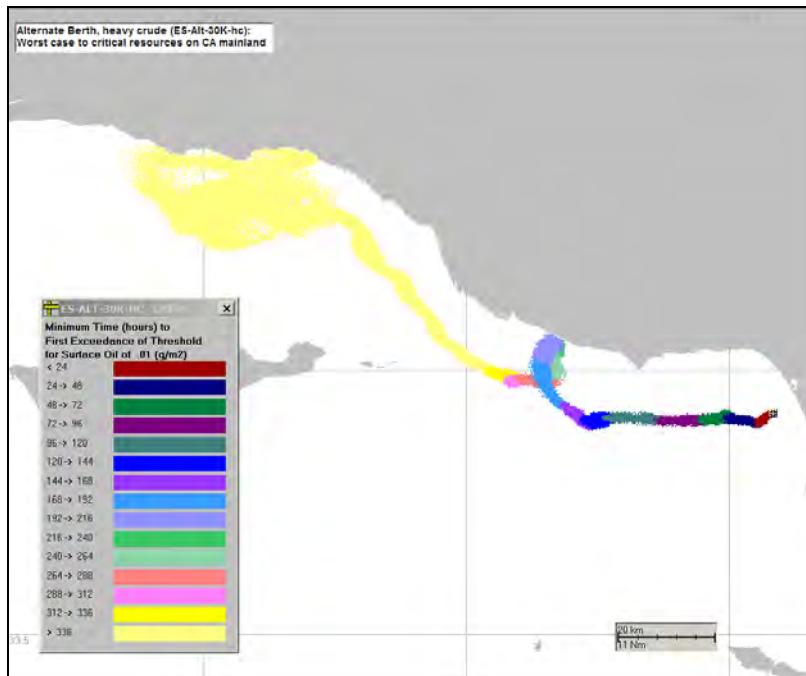


Figure C.6-90. Alternate Berth heavy crude (ES-Alt-30K-hc): Minimum time to first exceed threshold for surface oil (0.01 g/m²) for the worst run to the California mainland shore.

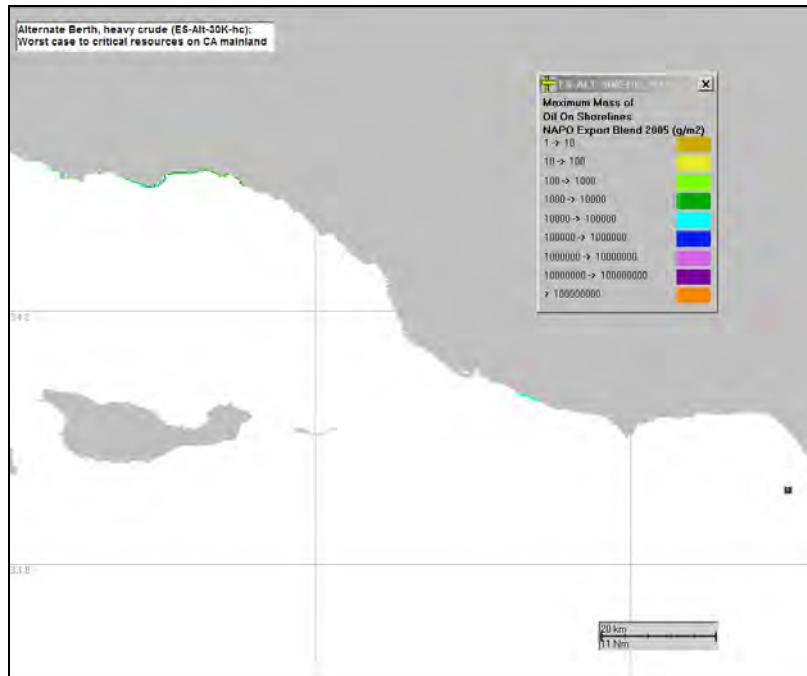


Figure C.6-91. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum mass (g/m²) of oil on the shoreline for the worst run to the California mainland shore.

There were no significant concentrations of entrained oil or dissolved aromatics in the water column for this model run. Thus, water column exposure and impacts would be minimal.

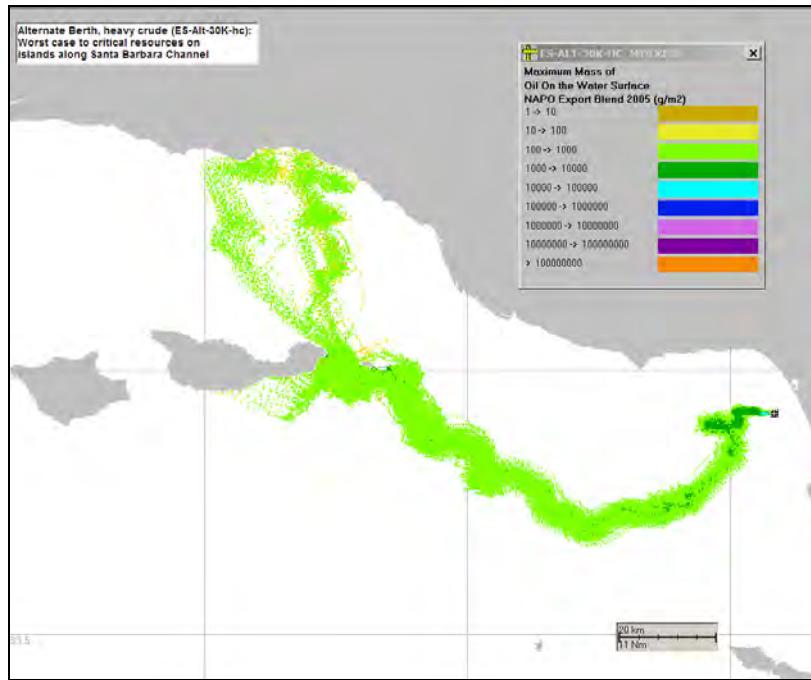


Figure C.6-92. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum exposure at any time to floating oil (g/m²) for the worst run to the islands along Santa Barbara Channel.

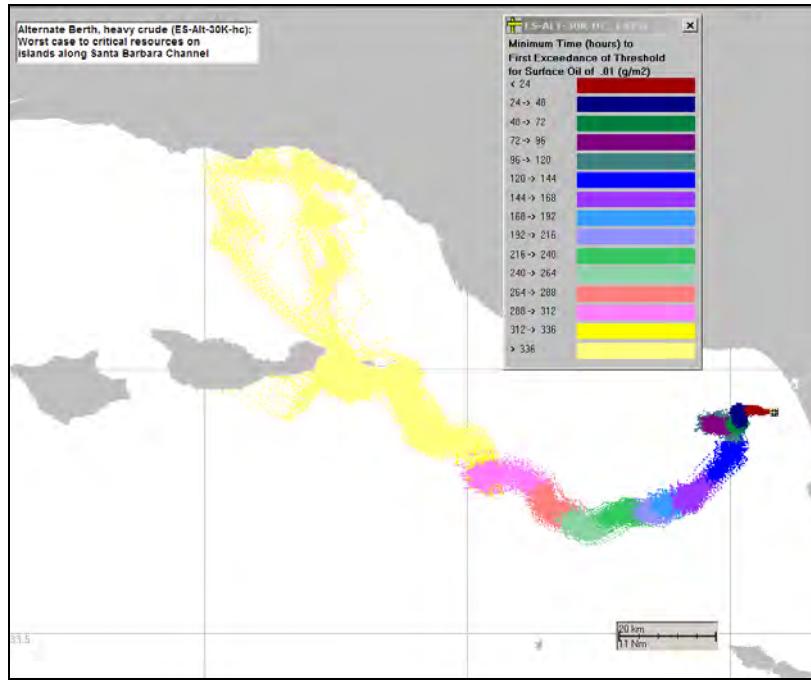


Figure C.6-93. Alternate Berth heavy crude (ES-Alt-30K-hc): Minimum time to first exceed threshold for surface oil (0.01 g/m²) for the worst run to the islands along Santa Barbara Channel.

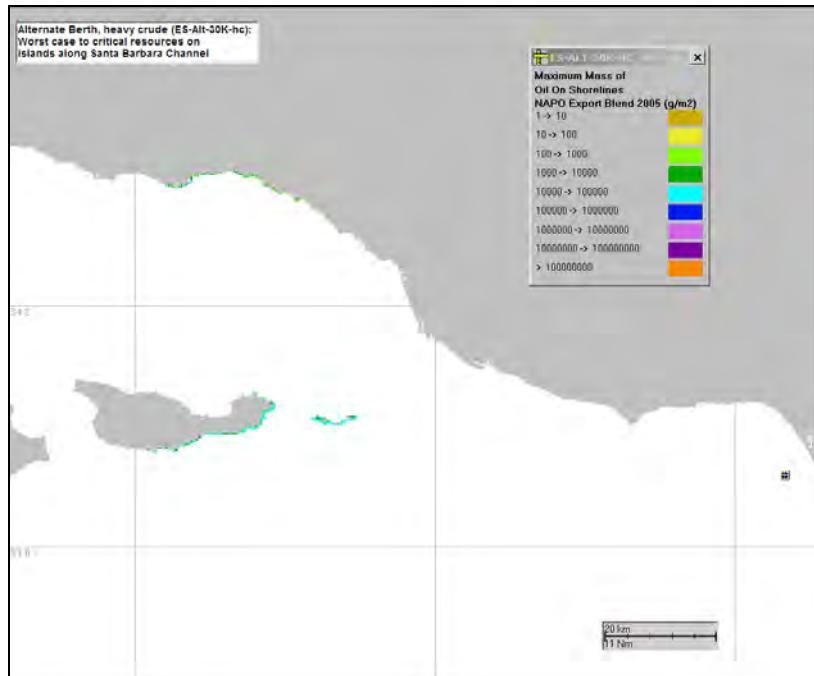


Figure C.6-94. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum mass (g/m²) of oil on the shoreline for the worst run to the islands along Santa Barbara Channel.

There were no significant concentrations of entrained oil or dissolved aromatics in the water column for this model run. Thus, water column exposure and impacts would be minimal.

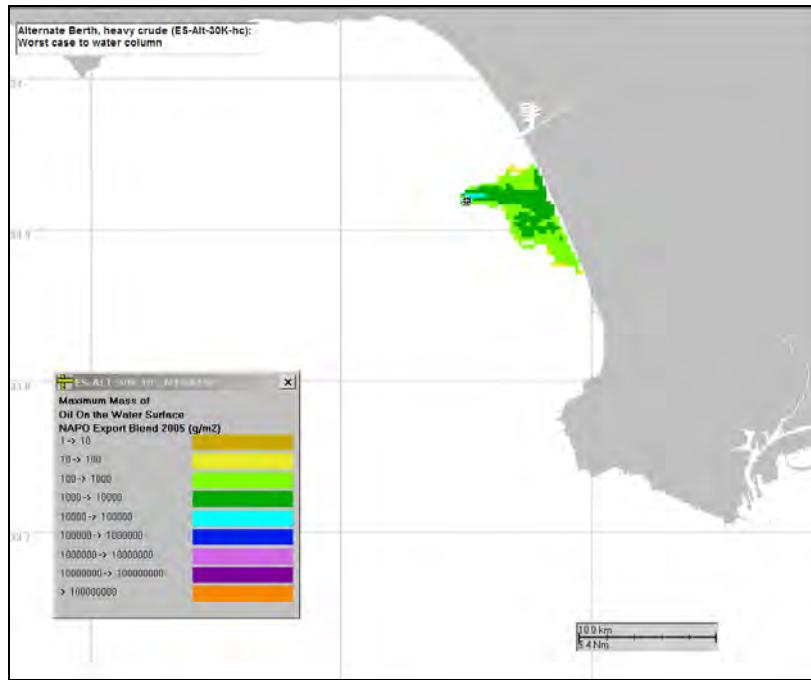


Figure C.6-95. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum exposure at any time to floating oil (g/m²) for the worst run to the water column.

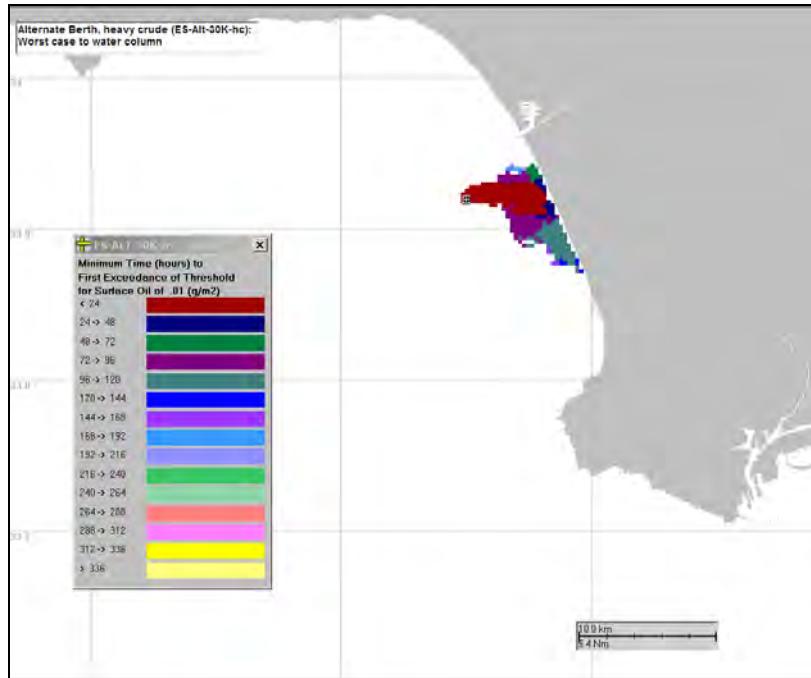


Figure C.6-96. Alternate Berth heavy crude (ES-Alt-30K-hc): Minimum time to first exceed threshold for surface oil (0.01 g/m²) for the worst run to the water column.

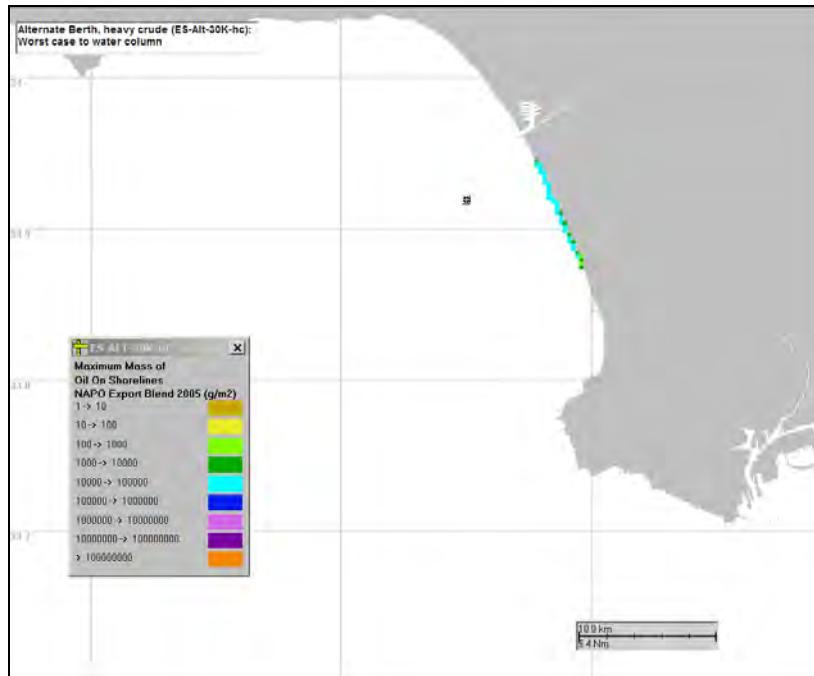


Figure C.6-97. Alternate Berth heavy crude (ES-Alt-30K-hc): Maximum mass (g/m^2) of oil on the shoreline for the worst run to the water column.

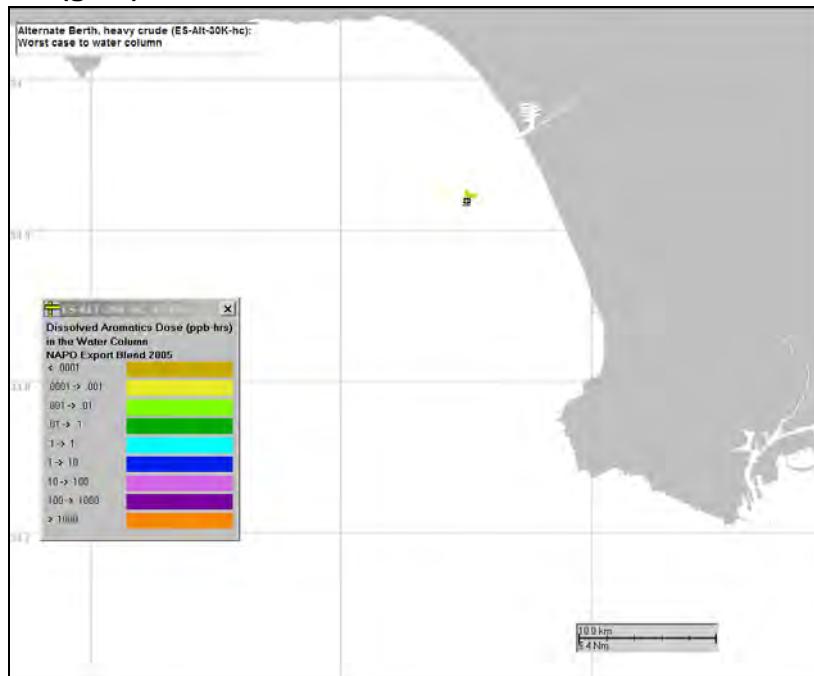


Figure C.6-98. Alternate Berth heavy crude (ES-Alt-30K-hc): Dose (ppb-hrs) of dissolved aromatics in the water column for the worst run to the water column.

C.7 Shoreline Areas Exposed by Shore Type for Individual Model Runs

The tables in this section (Tables C.7-1 to C.7-76) list the areas of shoreline oiled by shore (or habitat) type for each individual worst case run examined. Tables C.7-1 to C.7-3 are for the three 1,000 bbl spills at the terminal, which were the same date and time as the worst case to California mainland for the 11,000 bbl and 12,090 bbl diesel and crude spills, respectively, but were of the lower volume. Table C.7-77 summarizes the results. Discussion may be found after Table C.7-78.

Table C.7-1. Terminal, 1,000 bbl diesel (ES-Pipe-1k-d), worst case to California mainland: Area of shore (by shore type) oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Shore Type	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Rocky shoreline	0	0	1,721	0.001	11,474	0.004	24,668	0.01	37,289	0.01
Gravel beach	0	0	574	0.0002	1,147	0.0004	2,295	0.001	6,311	0.002
Sand beach	0	0	0	0.00	2,868	0.001	14,342	0.01	25,816	0.01
Total shoreline	0	0	2,295	0.001	15,489	0.006	41,305	0.02	69,416	0.03

Table C.7-2. Terminal, 1,000 bbl light crude (ES-Pipe-1k-1c), worst case to California mainland: Area of shore (by shore type) oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Shore Type	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Rocky shoreline	9,753	0.004	18,358	0.01	40,732	0.02	55,074	0.02	75,726	0.03
Gravel beach	1,147	0.0004	9,753	0.004	15,489	0.01	18,358	0.01	20,653	0.01
Sand beach	0	0	8,605	0.003	25,816	0.01	48,763	0.02	77,447	0.03
Wetland	0	0	0	0	68,842	0.03	103,263	0.04	103,263	0.04
Seagrass	0	0	0	0	0	0	574	0.0002	574	0.0002
Total shoreline	10,900	0.004	36,716	0.01	150,879	0.06	226,032	0.09	277,663	0.11

Table C.7-3. Terminal, 1,000 bbl heavy crude (ES-Pipe-1k-hc) , worst case to California mainland: Area of shore (by shore type) oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Shore Type	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Rocky shoreline	12,047	0.005	24,095	0.01	25,816	0.01	25,816	0.01	25,816	0.01
Gravel beach	1,147	0.0004	9,179	0.004	10,326	0.004	10,326	0.004	10,326	0.004
Sand beach	0	0	14,342	0.01	20,079	0.01	20,079	0.01	20,079	0.01
Wetland	0	0	0	0	68,842	0.03	68,842	0.03	68,842	0.03
Total shoreline	13,195	0.005	47,616	0.02	125,063	0.05	125,063	0.05	125,063	0.05

Table C.7-4. Terminal, diesel (ES-Pipe-11k-d): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	63,679	0.025	70,563	0.027	76,874	0.030	76,874	0.030
Worst case to islands	0	0	78,021	0.030	118,179	0.046	130,800	0.051	136,537	0.053
Worst case to water column	0	0	8,032	0.003	12,621	0.005	18,932	0.007	21,226	0.008

Table C.7-5. Terminal, diesel (ES-Pipe-11k-d): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	10,900	0.004	28,684	0.011	31,553	0.012	33,274	0.013	33,274	0.013
Worst case to islands	0	0	10,900	0.004	22,947	0.009	26,963	0.010	28,110	0.011
Worst case to water column	0	0	1,721	0.001	4,589	0.002	5,737	0.002	6,311	0.002

Table C.7-6. Terminal, diesel (ES-Pipe-11k-d): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	28,684	0.011	131,947	0.051	186,447	0.072	200,789	0.078	215,132	0.083
Worst case to islands	0	0	88,921	0.034	146,289	0.056	189,316	0.073	229,474	0.089
Worst case to water column	0	0	83,184	0.032	157,763	0.061	163,500	0.063	183,579	0.071

Table C.7-7. Terminal, diesel (ES-Pipe-11k-d): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	240,947	0.093	413,052	0.159	619,578	0.239	653,999	0.253
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-8. Terminal, diesel (ES-Pipe-11k-d): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	39,584	0.015	465,258	0.180	701,616	0.271	930,516	0.359	979,279	0.378
Worst case to islands	0	0	177,842	0.069	287,416	0.111	347,079	0.134	394,121	0.152
Worst case to water column	0	0	92,937	0.036	174,974	0.068	188,168	0.073	211,116	0.082

Table C.7-9. Terminal, light crude (ES-Pipe-12k-1c): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	37,863	0.015	52,205	0.020	65,974	0.025	70,563	0.027	74,005	0.029
Worst case to islands	24,095	0.009	44,747	0.017	77,447	0.030	90,642	0.035	96,953	0.037
Worst case to water column	1,721	0.001	1,721	0.001	1,721	0.001	1,721	0.001	1,721	0.001

Table C.7-10. Terminal, light crude (ES-Pipe-12k-1c): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	20,079	0.008	24,668	0.010	30,405	0.012	32,126	0.012	32,126	0.012
Worst case to islands	2,868	0.001	5,163	0.002	9,179	0.004	10,326	0.004	11,474	0.004
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-11. Terminal, light crude (ES-Pipe-12k-1c): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	11,474	0.004	86,053	0.033	137,684	0.053	186,447	0.072	203,658	0.079
Worst case to islands	0	0.0	40,158	0.016	60,237	0.023	63,105	0.024	65,974	0.025
Worst case to water column	0	0.0	48,763	0.019	74,579	0.029	74,579	0.029	74,579	0.029

Table C.7-12. Terminal, light crude (ES-Pipe-12k-1c): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	172,105	0.066	309,789	0.120	447,473	0.173	516,315	0.199
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-13. Terminal, light crude (ES-Pipe-12k-1c): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	69,416	0.027	335,032	0.129	543,852	0.210	736,610	0.284	826,105	0.319
Worst case to islands	26,963	0.010	90,068	0.035	146,863	0.057	164,074	0.063	174,400	0.067
Worst case to water column	1,721	0.001	50,484	0.019	76,300	0.029	76,300	0.029	76,300	0.029

Table C.7-14. Terminal, heavy crude (ES-Pipe-12k-hc): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	40,732	0.016	45,895	0.018	45,895	0.018	45,895	0.018	45,895	0.018
Worst case to islands	37,289	0.014	40,732	0.016	40,732	0.016	40,732	0.016	40,732	0.016
Worst case to water column	574	0.0002	574	0.0002	574	0.0002	574	0.0002	574	0.0002

Table C.7-15. Terminal, heavy crude (ES-Pipe-12k-hc): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	20,653	0.008	21,226	0.008	21,226	0.008	21,226	0.008	21,226	0.008
Worst case to islands	1,721	0.001	2,295	0.001	2,295	0.001	2,295	0.001	2,295	0.001
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-16. Terminal, heavy crude (ES-Pipe-12k-hc): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	43,026	0.017	80,316	0.031	83,184	0.032	83,184	0.032	83,184	0.032
Worst case to islands	0	0	43,026	0.017	51,632	0.020	51,632	0.020	51,632	0.020
Worst case to water column	0	0	51,632	0.020	71,710	0.028	74,579	0.029	74,579	0.029

Table C.7-17. Terminal, heavy crude (ES-Pipe-12k-hc): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	172,105	0.066	240,947	0.093	240,947	0.093	240,947	0.093
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-18. Terminal, heavy crude (ES-Pipe-12k-hc): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	104,411	0.040	319,542	0.123	391,253	0.151	391,253	0.151	391,253	0.151
Worst case to islands	39,010	0.015	86,053	0.033	94,658	0.037	94,658	0.037	94,658	0.037
Worst case to water column	574	0.000	52,205	0.020	72,284	0.028	75,153	0.029	75,153	0.029

Table C.7-19. Transit, diesel (ES-Trans-d): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	36,142	0.014	37,289	0.014	37,289	0.014	37,289	0.014
Worst case to islands	0	0	201,364	0.078	221,443	0.085	224,885	0.087	224,885	0.087
Worst case to water column	0	0	127,358	0.049	131,948	0.051	133,669	0.052	136,537	0.053

Table C.7-20. Transit, diesel (ES-Trans-d): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	5,163	0.002	9,179	0.004	10,900	0.004	10,900	0.004	10,900	0.004
Worst case to islands	6,311	0.002	26,963	0.010	32,126	0.012	32,126	0.012	32,126	0.012
Worst case to water column	6,884	0.003	24,668	0.010	24,668	0.010	24,668	0.0095	24,668	0.0095

Table C.7-21. Transit, diesel (ES-Trans-d): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	174,974	0.068	355,684	0.137	395,841	0.153	404,447	0.156	407,315	0.157
Worst case to islands	246,684	0.095	315,526	0.122	372,894	0.144	384,368	0.148	384,368	0.148
Worst case to water column	470,420	0.182	633,920	0.245	659,736	0.255	674,078	0.260	679,815	0.262

Table C.7-22. Transit, diesel (ES-Trans-d): Area of mudflat oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	34,421	0.013	34,421	0.013
Worst case to islands	34,421	0.013	34,421	0.013	34,421	0.013	34,421	0.013	34,421	0.013
Worst case to water column	0	0	206,526	0.080	206,526	0.080	206,526	0.080	206,526	0.080

Table C.7-23. Transit, diesel (ES-Trans-d): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	757,262	0.292	998,209	0.385	1,307,998	0.505	1,376,840	0.532	1,445,682	0.558
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	68,842	0.027	585,157	0.226	791,683	0.306	963,788	0.372	998,209	0.385

Table C.7-24. Transit, diesel (ES-Trans-d): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	1,721	0.001	1,721	0.001	1,721	0.001	1,721	0.001
Worst case to islands	0	0	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004
Worst case to water column	0	0	574	0.0002	574	0.0002	574	0.0002	574	0.0002

Table C.7-25. Transit, diesel (ES-Trans-d): Area of artificial shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	344	0.0001	717	0.0003

Table C.7-26. Transit, diesel (ES-Trans-d): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	937,399	0.362	1,400,935	0.541	1,753,748	0.677	1,865,615	0.720	1,937,326	0.748
Worst case to islands	287,416	0.111	579,421	0.224	662,032	0.256	676,948	0.261	676,948	0.261
Worst case to water column	546,146	0.211	1,578,198	0.609	1,815,129	0.701	2,003,641	0.774	2,047,040	0.790

Table C.7-27. Transit, light crude (ES-Trans-Ic): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	25,816	0.010	31,553	0.012	33,274	0.013	33,274	0.013	33,847	0.013
Worst case to islands	205,380	0.079	215,132	0.083	216,280	0.084	217,427	0.084	217,427	0.084
Worst case to water column	8,605	0.003	10,326	0.004	10,326	0.004	10,326	0.004	10,326	0.004

Table C.7-28. Transit, light crude (ES-Trans-Ic): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	3,442	0.001	6,311	0.002	6,884	0.003	6,884	0.003	7,458	0.003
Worst case to islands	36,142	0.014	40,732	0.016	40,732	0.016	41,305	0.016	41,879	0.016
Worst case to water column	4,016	0.002	4,016	0.002	4,016	0.002	4,016	0.002	4,016	0.002

Table C.7-29. Transit, light crude (ES-Trans-Ic): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	186,447	0.072	321,263	0.124	327,000	0.126	335,605	0.130	347,078	0.134
Worst case to islands	129,079	0.050	172,105	0.066	183,579	0.071	186,447	0.072	195,053	0.075
Worst case to water column	189,316	0.073	220,868	0.085	226,605	0.087	226,605	0.087	226,605	0.087

Table C.7-30. Transit, light crude (ES-Trans-Ic): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	585,157	0.226	826,104	0.319	894,946	0.346	998,209	0.385	1,170,314	0.452
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-31. Transit, light crude (ES-Trans-Ic): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	1,147	0.0004	1,721	0.001	1,721	0.001	1,721	0.001	1,721	0.001
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-32. Transit, light crude (ES-Trans-Ic): Area of artificial shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	29	0.00001	29	0.00001

Table C.7-33. Transit, light crude (ES-Trans-Ic): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	802,010	0.310	1,186,951	0.458	1,263,824	0.488	1,375,692	0.531	1,560,418	0.602
Worst case to islands	370,601	0.143	427,970	0.165	440,591	0.170	445,180	0.172	454,359	0.175
Worst case to water column	201,937	0.078	235,211	0.091	240,947	0.093	240,976	0.093	240,976	0.093

Table C.7-34. Transit, heavy crude (ES-Trans-hc): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	16,063	0.006	16,063	0.006	16,063	0.006	16,063	0.006	16,063	0.006
Worst case to islands	119,327	0.046	122,769	0.047	122,769	0.047	122,769	0.047	122,769	0.047
Worst case to water column	45,321	0.017	45,895	0.018	45,895	0.018	45,895	0.018	45,895	0.018

Table C.7-35. Transit, heavy crude (ES-Trans-hc): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	14,342	0.006	14,916	0.006	14,916	0.006	14,916	0.006	14,916	0.006
Worst case to islands	12,047	0.005	12,621	0.005	12,621	0.005	12,621	0.005	12,621	0.005
Worst case to water column	574	0.0002	574	0.0002	574	0.0002	574	0.0002	574	0.0002

Table C.7-36. Transit, heavy crude (ES-Trans-hc): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	283,974	0.110	304,052	0.117	304,052	0.117	304,052	0.117	304,052	0.117
Worst case to islands	255,289	0.099	275,368	0.106	275,368	0.106	275,368	0.106	275,368	0.106
Worst case to water column	143,421	0.055	149,158	0.058	149,158	0.058	149,158	0.058	149,158	0.058

Table C.7-37. Transit, heavy crude (ES-Trans-hc): Area of mudflat oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	68,842	0.027	103,263	0.040	103,263	0.040	103,263	0.040	103,263	0.040
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-38. Transit, heavy crude (ES-Trans-hc): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	240,947	0.093	309,789	0.120	309,789	0.120	309,789	0.120	309,789	0.120
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-39. Transit, heavy crude (ES-Trans-hc): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-40. Transit, heavy crude (ES-Trans-hc): Area of artificial shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	201	0.0001	229	0.0001	229	0.0001
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-41. Transit, heavy crude (ES-Trans-hc): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	624,168	0.241	748,084	0.289	748,285	0.289	748,313	0.289	748,313	0.289
Worst case to islands	387,811	0.150	411,905	0.159	411,905	0.159	411,905	0.159	411,905	0.159
Worst case to water column	189,316	0.073	195,626	0.076	195,626	0.076	195,626	0.076	195,626	0.076

Table C.7-42. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004
Worst case to islands	0	0	30,405	0.012	56,221	0.022	69,416	0.027	78,595	0.030
Worst case to water column	0	0	29,832	0.012	52,205	0.020	59,663	0.023	61,384	0.024

Table C.7-43. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	0	0	2,868	0.001	5,163	0.002	5,737	0.002
Worst case to water column	0	0	7,458	0.003	13,768	0.005	16,063	0.0062	16,063	0.0062

Table C.7-44. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	14,342	0.006	37,289	0.014	45,895	0.018	45,895	0.018
Worst case to islands	0	0	14,342	0.006	83,184	0.032	114,737	0.044	134,816	0.052
Worst case to water column	0	0	5,737	0.002	140,553	0.054	235,210	0.091	272,500	0.105

Table C.7-45. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	68,842	0.027	137,684	0.053	172,105	0.066	172,105	0.066
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	68,842	0	103,263	0	103,263	0

Table C.7-46. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	0	0	574	0.0002	574	0.0002	574	0.0002
Worst case to water column	0	0	574	0.0002	574	0.0002	574	0.0002	574	0.0002

Table C.7-47. Transit, 2,500 bbl diesel (ES-Trans-2K-d): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	84,331	0.033	176,120	0.068	219,147	0.085	219,147	0.085
Worst case to islands	0	0	44,747	0.017	142,847	0.055	189,890	0.073	219,722	0.085
Worst case to water column	0	0	43,601	0.017	275,942	0.107	414,773	0.160	453,784	0.175

Table C.7-48. Transit, 2,500 bbl light crude (ES-Trans-2K-Ic): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004
Worst case to islands	15,489	0	43,026	0.017	68,842	0.027	104,411	0.040	128,506	0.050
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-49. Transit, 2,500 bbl light crude (ES-Trans-2K-Ic): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	574	0.0002	3,442	0.001	8,032	0.003	10,900	0.004	14,342	0.006
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-50. Transit, 2,500 bbl light crude (ES-Trans-2K-Ic): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	17,211	0.007	37,289	0.014	48,763	0.019	48,763	0.019
Worst case to islands	0	0	0	0	2,868	0.001	5,737	0.002	28,684	0.011
Worst case to water column	0	0	14,342	0.006	22,947	0.009	34,421	0.013	34,421	0.013

Table C.7-51. Transit, 2,500 bbl light crude (ES-Trans-2K-Ic): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	103,263	0.040	137,684	0.053	172,105	0.066	172,105	0.066
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-52. Transit, 2,500 bbl light crude (ES-Trans-2K-Ic): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	121,621	0.047	176,120	0.068	222,015	0.086	222,015	0.086
Worst case to islands	16,063	0.006	46,468	0.018	79,742	0.031	121,048	0.047	171,532	0.066
Worst case to water column	0	0	14,342	0.006	22,947	0.009	34,421	0.013	34,421	0.013

Table C.7-53. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	1,147	0.0004	3,442	0.001	3,442	0.001	3,442	0.001	3,442	0.001
Worst case to islands	14,342	0.006	23,521	0.009	26,963	0.010	26,963	0.010	26,963	0.010
Worst case to water column	4,016	0.002	9,753	0.004	9,753	0.004	9,753	0.004	9,753	0.004

Table C.7-54. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	4,589	0.002	8,605	0.003	11,474	0.004	11,474	0.004	11,474	0.004
Worst case to islands	574	0.000	2,868	0.001	3,442	0.001	3,442	0.001	3,442	0.001
Worst case to water column	0	0	574	0.0002	574	0.0002	574	0.0002	574	0.0002

Table C.7-55. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	22,947	0.009	83,184	0.032	86,053	0.033	91,789	0.035
Worst case to islands	0	0	14,342	0.006	51,632	0.020	54,500	0.021	54,500	0.021
Worst case to water column	5,737	0.002	22,947	0.009	37,289	0.014	43,026	0.017	43,026	0.017

Table C.7-56. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of mudflat oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	34,421	0.01	34,421	0.01	34,421	0.01
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-57. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	68,842	0.03	103,263	0.04	103,263	0.04
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-58. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	574	0.0002	574	0.0002	574	0.0002	574	0.0002	574	0.0002
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-59. Transit, 2,500 bbl heavy crude (ES-Trans-2K-hc): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	5,736	0.002	34,994	0.014	201,363	0.078	238,653	0.092	244,389	0.094
Worst case to islands	15,490	0.006	41,305	0.016	82,611	0.032	85,479	0.033	85,479	0.033
Worst case to water column	9,753	0.004	33,274	0.013	47,616	0.018	53,353	0.021	53,353	0.021

Table C.7-60. Alternate Berth, diesel (ES-Alt-30k-d): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	25,816	0.010	28,684	0.011	29,832	0.012	29,832	0.012
Worst case to islands	0	0	193,332	0.075	208,248	0.080	209,395	0.081	209,395	0.081
Worst case to water column	0	0	6,884	0.003	6,884	0.003	6,884	0.003	6,884	0.003

Table C.7-61. Alternate Berth, diesel (ES-Alt-30k-d): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	1,721	0.001	6,311	0.002	8,032	0.003	8,032	0.003	8,032	0.003
Worst case to islands	18,932	0.007	28,110	0.011	30,405	0.012	30,979	0.012	30,979	0.012
Worst case to water column	0	0	2,868	0.001	3,442	0.001	4,016	0.0016	4,016	0.0016

Table C.7-62. Alternate Berth, diesel (ES-Alt-30k-d): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	60,237	0.023	209,395	0.081	252,421	0.097	281,105	0.109	286,842	0.111
Worst case to islands	68,842	0.027	169,237	0.065	218,000	0.084	223,737	0.086	223,737	0.086
Worst case to water column	65,974	0.025	149,158	0.058	163,500	0.063	163,500	0.063	166,368	0.064

Table C.7-63. Alternate Berth, diesel (ES-Alt-30k-d): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	103,263	0.040	413,052	0.159	757,262	0.292	826,104	0.319	894,946	0.346
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-64. Alternate Berth, diesel (ES-Alt-30k-d): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	574	0.0002	574	0.0002	574	0.0002	574	0.0002
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-65. Alternate Berth, diesel (ES-Alt-30k-d): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	165,221	0.064	654,573	0.253	1,046,399	0.404	1,145,072	0.442	1,219,651	0.471
Worst case to islands	87,774	0.034	391,254	0.151	457,227	0.177	464,685	0.179	464,685	0.179
Worst case to water column	65,974	0.025	158,911	0.061	173,826	0.067	174,400	0.067	177,268	0.068

Table C.7-66. Alternate Berth, light crude (ES-Alt-30k-1c): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	20,653	0.008	28,110	0.011	30,405	0.012	32,700	0.013	33,274	0.013
Worst case to islands	98,674	0.038	122,769	0.047	133,095	0.051	145,142	0.056	154,895	0.060
Worst case to water column	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,147	0.0004	1,721	0.001

Table C.7-67. Alternate Berth, light crude (ES-Alt-30k-1c): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	4,589	0.002	6,311	0.002	6,884	0.003	7,458	0.003	8,032	0.003
Worst case to islands	17,784	0.007	22,374	0.009	24,095	0.009	24,095	0.009	25,816	0.010
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-68. Alternate Berth, light crude (ES-Alt-30k-1c): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	114,737	0.044	157,763	0.061	192,184	0.074	212,263	0.082	238,079	0.092
Worst case to islands	34,421	0.013	65,974	0.025	94,658	0.037	97,526	0.038	106,132	0.041
Worst case to water column	0	0	86,053	0.033	106,132	0.041	106,132	0.041	106,132	0.041

Table C.7-69. Alternate Berth, light crude (ES-Alt-30k-1c): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	68,842	0.027	344,210	0.133	413,052	0.159	516,315	0.199	585,157	0.226
Worst case to islands	0	0	0	0	0	0	0	0	0	0
Worst case to water column	0	0	0	0	34,421	0.013	34,421	0.013	34,421	0.013

Table C.7-70. Alternate Berth, light crude (ES-Alt-30k-1c): Area of seagrass oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	0	0	0	0	0	0	0	0	0	0
Worst case to islands	0	0	0	0	574	0.0002	574	0.0002	574	0.0002
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-71. Alternate Berth, light crude (ES-Alt-30k-1c): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	208,821	0.081	536,394	0.207	642,526	0.248	768,736	0.297	864,542	0.334
Worst case to islands	150,879	0.058	211,116	0.082	252,422	0.097	267,338	0.103	287,417	0.111
Worst case to water column	1,147	0.000	87,200	0.034	141,700	0.055	141,700	0.055	142,274	0.055

Table C.7-72. Alternate Berth, heavy crude (ES-Alt-30k-hc): Area of rocky shore oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	20,653	0.008	22,947	0.009	23,521	0.009	23,521	0.009	23,521	0.009
Worst case to islands	68,268	0.026	79,168	0.031	79,168	0.031	79,168	0.031	79,168	0.031
Worst case to water column	574	0.000	574	0.000	574	0.0002	574	0.0002	574	0.0002

Table C.7-73. Alternate Berth, heavy crude (ES-Alt-30k-hc): Area of gravel beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	4,589	0.002	6,311	0.002	6,311	0.002	6,311	0.002	6,311	0.002
Worst case to islands	28,110	0.011	29,832	0.012	29,832	0.012	29,832	0.012	29,832	0.012
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-74. Alternate Berth, heavy crude (ES-Alt-30k-hc): Area of sand beach oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	117,605	0.045	172,105	0.066	172,105	0.066	172,105	0.066	172,105	0.066
Worst case to islands	77,447	0.030	131,947	0.051	146,289	0.056	146,289	0.056	146,289	0.056
Worst case to water column	0	0	91,789	0.035	109,000	0.042	109,000	0.042	109,000	0.042

Table C.7-75. Alternate Berth, heavy crude (ES-Alt-30k-hc): Area of wetland oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	103,263	0.040	309,789	0.120	344,210	0.133	378,631	0.146	378,631	0.146
Worst case to islands	34,421	0.013	378,631	0.146	378,631	0.146	378,631	0.146	378,631	0.146
Worst case to water column	0	0	0	0	0	0	0	0	0	0

Table C.7-76. Alternate Berth, heavy crude (ES-Alt-30k-hc): Area of total shoreline oiled with average thickness greater than a threshold (e.g., 1mm ~ 1kg/m²).

Individual Run Criteria	Area (m ²) >1 mm	Area (mile ²) >1 mm	Area (m ²) >0.1 mm	Area (mile ²) >0.1 mm	Area (m ²) >0.01 mm	Area (mile ²) >0.01 mm	Area (m ²) >0.001 mm	Area (mile ²) >0.001 mm	Area (m ²) >0.0001 mm	Area (mile ²) >0.0001 mm
Worst case to mainland shore	246,111	0.095	511,152	0.197	546,147	0.211	580,568	0.224	580,568	0.224
Worst case to islands	208,248	0.080	619,579	0.239	633,921	0.245	633,921	0.245	633,921	0.245
Worst case to water column	574	0.000	92,363	0.036	109,574	0.042	109,574	0.042	109,574	0.042

Table C.7-77. Summary of expected shoreline area (m^2) oiled by more than 100 g/ m^2 based on the modeling.

Scenario Name	Worst case to CA mainland	Worst case to islands along Santa Barbara Channel	Worst case to water column
Terminal, diesel ; 1000bbl (ES-Pipe-1k-d)*	2,295	-	-
Terminal, light crude; 1000bbl (ES-Pipe-1k-lc)*	36,716	-	-
Terminal, heavy crude; 1000bbl (ES-Pipe-1k-hc)*	47,616	-	-
Terminal, diesel; 11,000bbl (ES-Pipe-11k-d)	465,258	177,842	92,937
Terminal, light crude; 12,090bbl (ES-Pipe-12k-lc)	335,032	90,068	50,484
Terminal, heavy crude; 12,090bbl (ES-Pipe-12k-hc)	319,542	86,053	52,205
Transit, diesel; 275,000bbl (ES-trans-d)	1,400,935	579,421	1,578,198
Transit, light crude; 275,000bbl (ES-trans-lc)	1,186,951	427,970	235,211
Transit, heavy crude; 275,000bbl (ES-trans-hc)	748,084	411,905	195,626
Transit, diesel; 2,500bbl (ES-trans-d-2K)	84,331	44,747	43,601
Transit, light crude; 2,500bbl (ES-trans-lc-2K)	121,621	46,468	14,342
Transit, heavy crude; 2,500bbl (ES-trans-hc-2K)	34,994	41,305	33,274
Alternate, diesel; 30,000bbl (ES-alt-30k-d)	654,573	391,254	158,911
Alternate, light crude; 30,000bbl (ES-alt-30k-lc)	536,394	211,116	87,200
Alternate, heavy crude; 30,000bbl (ES-alt-30k-hc)	511,152	619,579	92,363

* Only the worst case run to the mainland was simulated for operational spills of 1,000 bbl.

Table C.7-78. Summary of expected shoreline area (m^2) oiled by more than 1,000 g/ m^2 based on the modeling.

Scenario Name	Worst case to CA mainland	Worst case to islands along Santa Barbara Channel	Worst case to water column
Terminal, diesel ; 1000bbl (ES-Pipe-1k-d)*	0	-	-
Terminal, light crude; 1000bbl (ES-Pipe-1k-lc)*	10,900	-	-
Terminal, heavy crude; 1000bbl (ES-Pipe-1k-hc)*	13,195	-	-
Terminal, diesel; 11,000bbl (ES-Pipe-11k-d)	39,584	0	0
Terminal, light crude; 12,090bbl (ES-Pipe-12k-lc)	69,416	26,963	1,721
Terminal, heavy crude; 12,090bbl (ES-Pipe-12k-hc)	104,411	39,010	574
Transit, diesel; 275,000bbl (ES-trans-d)	937,399	287,416	546,146
Transit, light crude; 275,000bbl (ES-trans-lc)	802,010	370,601	201,937
Transit, heavy crude; 275,000bbl (ES-trans-hc)	624,168	387,811	189,316
Transit, diesel; 2,500bbl (ES-trans-d-2K)	0	0	0
Transit, light crude; 2,500bbl (ES-trans-lc-2K)	0	16,063	0
Transit, heavy crude; 2,500bbl (ES-trans-hc-2K)	5,736	15,490	9,753
Alternate, diesel; 30,000bbl (ES-alt-30k-d)	165,221	87,774	65,974
Alternate, light crude; 30,000bbl (ES-alt-30k-lc)	208,821	150,879	1,147
Alternate, heavy crude; 30,000bbl (ES-alt-30k-hc)	246,111	208,248	574

* Only the worst case run to the mainland was simulated for operational spills of 1,000 bbl.

Generally, the heavier the oil, the thicker the oil would be on shore. However, diesel oil spreads faster than the two crude oils and is more wide-spread. Therefore, if there is enough volume, diesel can oil a larger area of shoreline than crude oil. In some runs, the oil trajectory goes to sea, and so shoreline oiling is lower than the same scenario for another oil. Thus, there is variability in the trends.

For all of the scenarios modeled, the area of shoreline predicted to be heavily oiled ($>1,000 \text{ g/m}^2$) ranges from $1,000 \text{ m}^2$ to $940,000 \text{ m}^2$ (Table C.7-78). To put the areas in perspective, 1000 m^2 is equivalent to 100 m (0.1 km, 0.06 miles) of shore with a width of 10m , the width of the sand beach (the dominant shore type). Thus, $16,000 \text{ m}^2$ is equivalent to 1 mile of oiled beach.

Table C.7-77 summarizes oiling of intertidal habitats by more than 100 g/m^2 (which has been found to indicate adverse impacts to intertidal organisms, French et al., 1996), for the worst-case runs of the modeled scenarios. The range is from about $2,000 \text{ m}^2$ to $1,600,000 \text{ m}^2$, which is equivalent to 200 m (0.2 km, 0.12 miles) for operational spills to 160 km (100 miles) of shore for the worst-case in-transit spill where intertidal biota would be impacted.

C.8 Estimated Biological Impacts: Wildlife

The biological effects model (described in detail in French et al. 1996; French McCay 2002, 2003, 2004; with validation using oil spill case histories described in French McCay 2003, 2004 and French McCay and Rowe 2004) uses the results of the oil trajectory and fate modeling, as well as habitat-specific and seasonally-varying estimates of productivity of plant and animal communities at the base of the food chain and fish, invertebrate (including shellfish), bird, mammal and reptile densities to quantify biological effects in the environment of the spill. For each scenario examined, the area potentially affected by the spill is represented by a rectangular grid identifying deepwater, nearshore, wetland and shoreline habitats (Appendix C.2.1). The habitat grid matches the grid set up for the oil trajectory and fates model using the GIS data base. In the model, planktonic stages (eggs and larvae in the water column) are moved with the currents. Fish eggs, larvae, and juveniles are assumed constant and evenly distributed across each ecosystem within each month of an annual cycle. Fish, invertebrates, birds, mammals, reptiles (sea turtles) and productivity rates of lower trophic levels are assumed constant and evenly distributed across an ecosystem within each of four seasons.

In the model, surface slicks of oil and petroleum products interact with wildlife (birds, mammals, reptiles). A portion of wildlife in the area swept by the slick are assumed to die based on probability of encounter with the slick and mortality once oiled. Impacts on critical habitats and other sensitive sites are based on overlays of the oil trajectories on their locations mapped in the GIS.

For fish and their eggs and larvae, mortality is calculated using laboratory acute toxicity test data corrected for temperature and duration of exposure. Calculations assume a lognormal relationship between the dissolved concentration of the most toxic petroleum component, dissolved aromatics, and the percent of mortality of an exposed population. Movements of biota, either active or by current transport, are accounted for in determining the time history of concentration exposure. Organisms killed are integrated over space and time by habitat type to estimate a total kill.

Lost production of plants and animals at the base of the food chain is also computed. Lost production of fish, shellfish, birds, and mammals due to reduction or contamination of food supply is estimated using a simple food web model.

Biological impacts to wildlife (birds and marine or aquatic mammals) were estimated using the fates and biological model results of the 3 individual runs for each stochastic scenario. The criteria for the 3 individual runs were:

1. the worst case run for impacts to critical resources to the California mainland shore;

2. the worst case run for impacts for impacts to critical resources to the islands along Santa Barbara Channel (San Miguel Island, Santa Rosa Island, Santa Cruz Island, and Anacapa Island); and
3. the worst case run for oil contamination in the water column.

Wildlife (bird, mammal, reptile, and amphibian) densities were tabulated as number/km² by species and month of the year. Species categories were assigned to behavioral groups (Table C.8-1) to estimate exposure and subsequent mortality. The species categories were also assigned to trophic compartments for the food web model calculations, as shown in Table C.8-2. In addition, the species is assigned to a taxonomic group (Table C.8-3), which is used to summarize the results in the model outputs.

Table C.8-1. Wildlife behavior groups in marine and estuarine environments and assumed probability of oiling and mortality if a slick (> threshold thickness) sweeps a habitat occupied by that species.

Marine Behavior group	Default % Mortality	Habitats Occupied (freshwater)	Examples
Surface birds: Dabbling waterfowl	99	Intertidal, shorelines, landward waters	Dabblers, geese, swans, which use landward habitats and seaward shoreline areas
Nearshore aerial divers	35	Intertidal, shorelines, landward waters	Ospreys, eagles
Surface diving birds	99	All habitats	Loons, grebes, diving ducks, cormorants
Aerial seabirds	5	All habitats	Gulls, terns
Wetland wildlife	35	Wetlands and shorelines	Wading birds, shorebirds, muskrat, crocodilians
Terrestrial wildlife	0.1	Shorelines	Hawks, (terrestrial) bears
Cetaceans	0.1	Seaward subtidal	Whales, dolphins, porpoises
Furbearing marine mammals	75	All habitats	Fur seals, sea otters, polar bears
Pinnipeds, manatee	1	All habitats	Sea lions, phocid seals, walrus, manatee
Surface birds in seaward only	99	Seaward	Spend most of time on water surface; in exposed waters (e.g., alcids, phalaropes)
Surface diving birds in seaward only	35	Seaward	Spend time on water surface intermittently; in exposed waters (e.g., storm-petrels)
Aerial divers in seaward only	5	Seaward	Fly over water, diving occasionally (e.g., albatross, shearwaters, large petrels), or underwater most of time (e.g., sea turtles); in exposed waters
Surface birds in landward only	99	Landward	Spend most of time on water surface in protected waters (e.g., ruddy ducks, many dabblers)
Surface diving birds in landward only	35	Landward	In protected waters and spend time on water surface intermittently (e.g., skimmers)
Aerial divers in	5	Landward	Fly over protected waters, diving occasionally (e.g.,

Marine Behavior group	Default % Mortality	Habitats Occupied (freshwater)	Examples
landward only			kingfishers), or underwater most of time (e.g., turtles)
Surface diving birds in water only	35	All water	Spend time on water surface intermittently, do not land on shorelines (both landward and seaward waters)
Aerial divers in water only	5	All water	Fly over water, diving occasionally, or underwater most of time; do not land on shorelines (both landward and seaward waters)

Table C.8-2. Wildlife trophic categories.

Trophic Compartment Name	Description and Species Included
Planktivorous birds	Seabirds feeding on plankton
Small herbivorous mammals	Small rodents
Medium herbivorous wildlife	Muskrat, nutria; marine iguana
Large herbivorous mammals	Manatee, dudong
Benthic-feeding wildlife	Sea otters, walrus
Waterfowl	Dabblers, geese
Insectivores	Shrews, moles
Invertebrate-feeding wildlife	Shorebirds
Baleen whales	Baleen whales
Piscivorous wildlife	Fish-eaters
Aquatic omnivorous wildlife	Fish, benthos, and plankton feeders
Wildlife omnivores	Feed on fish and wildlife (e.g., killer whale)
Wildlife carnivores	Feed on wildlife (e.g., polar bear)

Table C.8-3. Wildlife taxonomic categories.

Wildlife Taxonomic Group
Waterfowl
Seabirds
Wading birds
Shorebirds
Raptors
Kingfishers
Cetaceans
Pinnipeds (seals)
Other mammals
Reptiles
Amphibians

The biological abundance data used for shorebirds, waders and marine mammals were based on data compiled by French et al. (1996) for biological regions termed provinces: province 41 (Los Angeles Coast) and 42 (Southern California Offshore). The abundance data for waterfowl, seabirds, sea ducks, loons and grebes were updated from the data compiled by French et al. (1996) in 1997 for California Fish & Game for use in the Natural Damage Assessment Model for California (NRDAM/CAL).

Data were supplied for the NRDAM/CAL by R. Glenn Ford, Ecological Consulting Inc., Portland, OR (pers. comm., March 1997). Offshore densities were computed from the Marine Mammal and Seabird Computer Database and Analysis System, California Outer Continental Shelf (OCS) 1975-1985, which was prepared for the Minerals Management Service (MMS), Pacific OCS Region, January 1993. Data from several studies are included in this system.

Densities for the NRDAM/CAL were computed using 5'X5' longitude-latitude gridded data. For each season and 5'X5' block, densities were computed as the number of birds of a given species that were observed divided by the product of the transect width and transect length. The densities for the 5'X5' block were then transferred to a finer scale grid of 400m X 400m cells. Densities for a province were computed as the sum of the densities of all 400m X 400m cells with midpoints falling within the province, divided by the number of cells. Only cells containing in excess of 5km of transect effort were used. In some provinces, sampling effort was only a small portion of the whole.

For modeling purposes, the area in which waterfowl, seabirds, sea ducks, loons and grebes would be impacted were divided into 10 oceanographic areas that correlate to the provinces in the NRDAM/CAL. These areas are listed in Table C.8-4.

Table C.8-4. Biological provinces used in modeling.

El Segundo Province	NRDAM/Cal Province	Area Description	Depth
1	3+4	Santa Monica Bay	<200m
2	22+23	Anacapa & Santa Cruz Islands	<200m
3	24+25	Santa Rosa Island	<200m
4	26+27	San Miguel Island	<200m
5	2	San Diego Shelf	<200m
6	19+20	Santa Barbara Channel	<200m
7	21	Santa Barbara Channel	>200m
8	6	San Pedro Channel	>200m
9	17	Santa Cruz Basin	>200m
10	7+8+11+12	South Channel Islands	<200m

Tables C.8-5 to C.8-16 provide the bird and mammal density data that was used in modeling.

Table C.8-5. Waterfowl and seabird density data for waters <200m in Santa Monica Bay.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.01	0.00	0.00	0.16
Loons	0.99	1.80	0.05	0.00	2.58
Grebes	0.35	1.48	0.58	0.00	0.00
Small alcids	0.35	0.44	0.02	0.01	0.00
Cormorants	0.35	0.27	0.08	0.03	0.01
Gulls	0.05	19.13	5.45	6.53	152.16
Jaegers	0.05	0.01	0.17	0.09	0.11
Kittiwakes	0.05	0.55	0.09	0.00	0.09
Murres	0.35	0.27	0.03	0.00	0.03
Phalaropes	0.99	0.30	1.88	3.86	0.22
Shearwaters and fulmars	0.05	0.09	4.15	0.63	0.03
Storm-petrels	0.35	0.00	0.00	0.51	0.22
Terns	0.05	0.18	0.00	0.15	0.00
Pelicans	0.05	0.08	0.48	0.24	1.02
Total		24.61	12.96	12.05	156.63

Table C.8-6. Waterfowl and seabird density data for waters <200m off Anacapa and Santa Cruz Islands.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.182	0.000	0.000	0.330
Loons	0.99	0.371	0.111	0.000	0.294
Grebes	0.35	0.000	0.000	0.000	0.207
Small alcids	0.35	2.276	1.327	0.076	0.160
Cormorants	0.35	11.804	0.153	0.055	2.414
Gulls	0.05	4.006	29.730	1.495	3.513
Jaegers	0.05	0.072	0.000	0.029	0.048
Kittiwakes	0.05	1.829	0.052	0.000	0.068
Murres	0.35	1.213	0.033	0.000	0.032
Phalaropes	0.99	1.488	3.370	0.287	1.452
Shearwaters and fulmars	0.05	0.137	1.338	3.184	0.104
Storm-petrels	0.35	1.488	0.000	0.211	0.000
Terns	0.05	0.000	0.041	0.126	0.004
Pelicans	0.05	0.245	0.000	0.748	0.334
Total		25.110	36.155	6.209	8.959

Table C.8-7. Waterfowl and seabird density data for waters <200m off Santa Rosa Island.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	2.827	0.000	0.000	0.833
Loons	0.99	0.915	0.113	0.000	0.775
Grebes	0.35	0.352	0.000	0.000	0.035
Small alcids	0.35	4.585	1.375	0.035	0.786
Cormorants	0.35	1.290	0.042	1.511	0.521
Gulls	0.05	3.483	1.544	1.079	3.072
Jaegers	0.05	0.084	0.005	0.051	0.156
Kittiwakes	0.05	4.213	0.025	0.000	0.036
Murres	0.35	1.600	0.000	0.000	0.122
Phalaropes	0.99	3.409	2.547	0.164	0.873
Shearwaters and fulmars	0.05	0.231	15.436	2.636	0.245
Storm-petrels	0.35	0.000	0.011	0.015	0.007
Terns	0.05	0.000	0.001	0.184	0.000
Pelicans	0.05	0.011	0.000	0.072	0.037
Total		22.999	21.097	5.747	7.499

Table C.8-8. Waterfowl and seabird density data for waters <200m off San Miguel Island.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.000	0.000	0.000	0.000
Loons	0.99	0.019	0.756	0.000	0.040
Grebes	0.35	0.000	0.000	0.000	0.000
Small alcids	0.35	3.982	2.959	0.961	0.657
Cormorants	0.35	2.345	0.208	0.018	0.049
Gulls	0.05	8.122	0.475	0.684	0.777
Jaegers	0.05	0.000	0.018	0.077	0.076
Kittiwakes	0.05	0.428	0.101	0.000	0.008
Murres	0.35	0.627	0.065	0.000	0.086
Phalaropes	0.99	0.088	1.726	0.933	0.292
Shearwaters and fulmars	0.05	0.403	8.659	8.607	0.184
Storm-petrels	0.35	0.000	0.000	0.062	0.222
Terns	0.05	0.000	0.000	0.194	0.000
Pelicans	0.05	0.000	0.000	0.025	0.332
Total		16.014	14.967	11.562	2.723

Table C.8-9. Waterfowl and seabird density data for waters <200m in San Diego Shelf.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.000	0.000	0.000	0.000
Loons	0.99	0.193	0.446	0.000	4.397
Grebes	0.35	0.089	0.000	0.000	0.029
Small alcids	0.35	0.827	0.064	0.098	0.082
Cormorants	0.35	0.422	0.066	0.648	0.858
Gulls	0.05	6.164	2.324	2.447	11.781
Jaegers	0.05	0.040	0.000	0.044	0.045
Kittiwakes	0.05	0.859	0.001	0.000	0.016
Murres	0.35	0.000	0.087	0.000	0.000
Phalaropes	0.99	0.129	2.283	4.972	3.235
Shearwaters and fulmars	0.05	0.391	0.103	0.123	1.320
Storm-petrels	0.35	0.000	0.002	4.721	0.000
Terns	0.05	0.165	0.206	0.424	0.000
Pelicans	0.05	0.090	0.051	0.505	1.150
Total		9.368	5.633	13.981	22.915

Table C.8-10. Waterfowl and seabird density data for waters <200m in Santa Barbara Channel.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.003	0.000	0.000	0.180
Loons	0.99	22.701	1.864	0.011	3.919
Grebes	0.35	2.710	0.145	0.000	6.744
Small alcids	0.35	0.572	0.031	0.158	0.333
Cormorants	0.35	0.350	0.064	0.000	0.118
Gulls	0.05	13.862	6.169	41.309	45.122
Jaegers	0.05	0.102	0.064	0.377	0.345
Kittiwakes	0.05	0.987	0.076	0.141	0.113
Murres	0.35	13.625	5.550	0.068	5.345
Phalaropes	0.99	0.013	1.403	4.071	0.386
Shearwaters and fulmars	0.05	0.452	2.657	20.151	0.370
Storm-petrels	0.35	0.000	0.000	0.187	0.000
Terns	0.05	0.000	0.000	0.060	0.000
Pelicans	0.05	0.615	1.368	1.489	4.954
Total		55.993	19.391	68.021	67.929

Table C.8-11. Waterfowl and seabird density data for waters >200m in Santa Barbara Channel.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.083	0.000	0.000	0.346
Loons	0.99	0.579	0.302	0.001	0.207
Grebes	0.35	0.008	0.035	0.000	0.065
Small alcids	0.35	2.157	1.155	0.021	0.052
Cormorants	0.35	0.344	0.202	0.006	0.411
Gulls	0.05	2.967	3.605	1.601	7.080
Jaegers	0.05	0.068	0.023	0.292	0.067
Kittiwakes	0.05	0.377	0.177	0.000	0.394
Murres	0.35	1.156	0.181	0.000	0.120
Phalaropes	0.99	0.000	0.432	0.155	0.104
Shearwaters and fulmars	0.05	0.006	14.968	1.639	0.339
Storm-petrels	0.35	0.000	0.000	0.078	0.000
Terns	0.05	0.000	0.008	0.479	0.051
Pelicans	0.05	0.159	0.023	0.509	1.013
Total		7.904	21.110	4.781	10.250

Table C.8-12. Waterfowl and seabird density data for waters >200m in San Pedro Channel.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.025	0.000	0.000	0.133
Loons	0.99	0.133	0.149	0.001	0.176
Grebes	0.35	0.031	0.000	0.000	0.012
Small alcids	0.35	0.686	0.135	0.033	0.021
Cormorants	0.35	0.137	0.040	0.117	0.145
Gulls	0.05	6.304	1.003	10.675	7.960
Jaegers	0.05	0.072	0.030	0.546	0.034
Kittiwakes	0.05	1.306	0.068	0.000	0.035
Murres	0.35	0.501	0.163	0.000	0.115
Phalaropes	0.99	0.084	3.514	1.002	0.400
Shearwaters and fulmars	0.05	0.146	58.526	2.273	0.045
Storm-petrels	0.35	0.000	0.015	0.493	0.016
Terns	0.05	0.000	0.007	1.384	0.000
Pelicans	0.05	0.146	0.154	0.628	0.238
Total		9.570	63.803	17.152	9.329

Table C.8-13. Waterfowl and seabird density data for waters >200m in Santa Cruz Basin.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.008	0.000	0.000	0.055
Loons	0.99	0.079	0.070	0.014	0.154
Grebes	0.35	0.000	0.000	0.000	0.015
Small alcids	0.35	5.257	0.561	0.054	0.239
Cormorants	0.35	0.206	0.012	0.028	0.984
Gulls	0.05	1.597	0.705	0.535	1.765
Jaegers	0.05	0.072	0.021	0.061	0.402
Kittiwakes	0.05	1.368	0.021	0.000	0.047
Murres	0.35	0.294	0.023	0.000	0.005
Phalaropes	0.99	0.352	0.730	0.218	0.420
Shearwaters and fulmars	0.05	0.100	16.993	1.512	0.105
Storm-petrels	0.35	0.200	0.029	0.243	0.007
Terns	0.05	0.000	0.014	0.095	0.000
Pelicans	0.05	0.086	0.024	0.118	0.270
Total		9.617	19.202	2.877	4.468

Table C.8-14. Waterfowl and seabird density data for waters <200m off Santa Catalina and Santa Barbara Islands.

Species	Probability of Oiling	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Sea ducks	0.99	0.000	0.000	0.000	0.015
Loons	0.99	0.016	0.744	0.000	0.075
Grebes	0.35	0.000	0.000	0.000	0.079
Small alcids	0.35	1.923	1.089	0.003	0.115
Cormorants	0.35	1.619	0.013	0.006	2.697
Gulls	0.05	9.504	1.999	1.444	8.762
Jaegers	0.05	0.472	0.002	0.234	0.045
Kittiwakes	0.05	1.000	0.000	0.000	0.104
Murres	0.35	0.489	0.000	0.000	0.005
Phalaropes	0.99	0.000	1.441	0.053	0.072
Shearwaters and fulmars	0.05	0.192	37.592	0.118	0.010
Storm-petrels	0.35	0.000	0.000	0.008	0.000
Terns	0.05	0.000	0.001	0.003	0.000
Pelicans	0.05	0.141	0.022	0.275	0.811
Total		15.356	42.904	2.143	12.790

Table C.8-15. Wading Bird, shorebird, and marine mammal density data for all locations (in suitable habitats) used in modeling.

Species	#/km ² for Winter	#/km ² for Spring	#/km ² for Summer	#/km ² for Fall
Wading birds	16	16	2	33
Shorebirds	1,048	768	491	793
Cetaceans	1	0	1	0.6
Pinnipeds (seals)	0	0.2	0.1	0.2
Total	1,066	785	494	827

The following tables (Table C.8-5 to C.8-119) are the biological results for all of the individual worst case runs. The terminal scenarios with 1,000 bbl are for the same dates and times as the worst case run to the California mainland for the respective 11,000 bbl or 12,090 bbl diesel or crude scenarios. The 2,500 bbl scenarios are for the same dates and times as the three worst case runs for the 275,000 bbl scenarios of each oil type. Tables C.8-120 to C.8-123 summarize the results.

Table C.8-5. Terminal, 1,000 bbl diesel (ES-Pipe-1k-d): Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to wading birds, shorebirds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	4	0.1	0.00000005
Shorebirds	97	0.1	0.00000005
Cetaceans (dolphins)	0.3	0.4	0.0000002
Pinnipeds (seals)	1	6.7	0.000003
Total	102		

Table C.8-6. Terminal, 1,000 bbl light crude (ES-Pipe-1k-lc): Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to wading birds, shorebirds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	7	0.2	0.0000001
Shorebirds	179	0.2	0.0000001
Cetaceans (dolphins)	1	1.2	0.0000004
Pinnipeds (seals)	3	16.3	0.00001
Total	190		

Table C.8-7. Terminal, 1,000 bbl heavy crude (ES-Pipe-1k-hc): Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to wading birds, shorebirds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	3	0.1	0.00000004
Shorebirds	80	0.1	0.00000004
Cetaceans (dolphins)	1	1.0	0.0000004
Pinnipeds (seals)	3	14.5	0.00001
Total	87		

Table C.8-8. Terminal, diesel (ES-Pipe-11k-d), worst case run to California mainland: Area oiled per biological province in Table C.8-4.

El Segundo Province	Fraction of total oiled area	Water Area Oiled (km ²)
1	0.08	410
2	0.11	512
3	0.00	0
4	0.00	0
5	0.00	0
6	0.22	1,053
7	0.07	349
8	0.40	1,914
9	0.12	605
10	0.00	0
All	1.00	4,844

Table C.8-9. Terminal, diesel (ES-Pipe-11k-d), worst case run to California mainland: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to wading birds, shorebirds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	23	0.7	0.0000003
Shorebirds	553	0.7	0.0000003
Cetaceans (dolphins)	2	3.4	0.000001
Pinnipeds (seals)	10	50.5	0.00002
Total	588		

* Area swept by oil of a thickness that would effect wildlife times the probability (<1.0) of the species being on the water surface as the oil passes. Results are total by species groups.

Table C.8-10. Terminal, diesel (ES-Pipe-11k-d), worst case run to California mainland: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) per season to seabirds and waterfowl. The date of this worst case scenario was in fall.

Species	Probability of Intersecting Oil	Equivalent Area 100% Oiled (km ²)	# Oiled (if in winter)	# Oiled (if in spring)	# Oiled (if in summer)	# Oiled (if in fall)
Sea ducks	0.99	4,795	181	0	0	824
Loons	0.99	4,795	25,088	2,448	21	5,782
Grebes	0.35	1,695	1,234	141	0	2,543
Small alcids	0.35	1,695	2,518	603	110	223
Cormorants	0.35	1,695	2,459	116	99	833
Gulls	0.05	242	1,929	1,377	3,413	6,527
Jaegers	0.05	242	18	11	82	38
Kittiwakes	0.05	242	283	17	7	21
Murres	0.35	1,695	5,817	2,192	25	2,074
Phalaropes	0.99	4,795	1,256	11,178	8,040	2,270
Shearwaters and fulmars	0.05	242	46	6,636	1,447	36
Storm-petrels	0.35	1,695	309	16	571	44
Terns	0.05	242	4	2	153	1
Pelicans	0.05	242	60	98	175	339
Total waterfowl and seabirds			41,200	24,834	14,144	21,554

Table C.8-11. Terminal, diesel (ES-Pipe-11k-d), worst case run to islands along Santa Barbara Channel: Area oiled per biological province in Table C.8-4.

EI Segundo Province	Fraction of total oiled area	Water Area Oiled (km ²)
1	0.11	152
2	0.22	299
3	0.01	15
4	0.00	2
5	0.00	0
6	0.04	52
7	0.06	82
8	0.55	732
9	0.00	6
10	0.00	0
All	1.00	1,340

Table C.8-12. Terminal, diesel (ES-Pipe-11k-d), worst case run to islands along Santa Barbara Channel: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to birds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	24	1.5	0.0000006
Shorebirds	1,528	1.5	0.0000006
Cetaceans (dolphins)	1	0.8	0.0000003
Pinnipeds (seals)	0	13.6	0.00001
Total	1,553		

* Area swept by oil of a thickness that would effect wildlife times the probability (<1.0) of the species being on the water surface as the oil passes. Results are total by species groups.

Table C.8-13. Terminal, diesel (ES-Pipe-11k-d), worst case run to islands along Santa Barbara Channel: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) per season to seabirds and waterfowl. The date of this worst case scenario was in winter.

Species	Probability of Intersecting Oil	Equivalent Area 100% Oiled (km ²)	# Oiled (if in winter)	# Oiled (if in spring)	# Oiled (if in summer)	# Oiled (if in fall)
Sea ducks	0.99	1,327	122	0	0	268
Loons	0.99	1,327	1,718	273	1	836
Grebes	0.35	469	139	34	0	151
Small alcids	0.35	469	547	219	21	35
Cormorants	0.35	469	1,311	38	45	309
Gulls	0.05	67	488	555	579	1,652
Jaegers	0.05	67	4	3	23	4
Kittiwakes	0.05	67	87	5	0	5
Murres	0.35	469	562	154	1	137
Phalaropes	0.99	1,327	599	3,980	1,622	797
Shearwaters and fulmars	0.05	67	9	2,279	198	6
Storm-petrels	0.35	469	156	4	182	16
Terns	0.05	67	1	1	56	0
Pelicans	0.05	67	12	13	42	39
Total waterfowl and seabirds			5,757	7,557	2,772	4,255

Table C.8-14. Terminal, diesel (ES-Pipe-11k-d), worst case run to water column: Area oiled per biological province in Table C.8-4.

EI Segundo Province	Fraction of total oiled area	Water Area Oiled (km ²)
1	1.00	230
2	0.00	0
3	0.00	0
4	0.00	0
5	0.00	0
6	0.00	0
7	0.00	0
8	0.00	0
9	0.00	0
10	0.00	0
All	1.00	230

Table C.8-15. Terminal, diesel (ES-Pipe-11k-d), worst case run to water column: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to birds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	30	1.8	0.0000007
Shorebirds	1,388	1.8	0.0000007
Cetaceans (dolphins)	0	0.0	0.0
Pinnipeds (seals)	0	2.4	0.000001
Total	1,418		

* Area swept by oil of a thickness that would effect wildlife times the probability (<1.0) of the species being on the water surface as the oil passes. Results are total by species groups.

Table C.8-16. Terminal, diesel (ES-Pipe-11k-d), worst case run to water column: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) per season to seabirds and waterfowl. The date of this worst case scenario was in spring.

Species	Probability of Intersecting Oil	Equivalent Area 100% Oiled (km ²)	# Oiled (if in winter)	# Oiled (if in spring)	# Oiled (if in summer)	# Oiled (if in fall)
Sea ducks	0.99	227	3	0	0	37
Loons	0.99	227	410	11	0	587
Grebes	0.35	80	119	46	0	0
Small alcids	0.35	80	35	2	1	0
Cormorants	0.35	80	22	6	2	1
Gulls	0.05	11	220	62	75	1,746
Jaegers	0.05	11	0	2	1	1
Kittiwakes	0.05	11	6	1	0	1
Murres	0.35	80	21	2	0	3
Phalaropes	0.99	227	67	427	877	49
Shearwaters and fulmars	0.05	11	1	48	7	0
Storm-petrels	0.35	80	0	0	41	18
Terns	0.05	11	2	0	2	0
Pelicans	0.05	11	1	6	3	12
Total waterfowl and seabirds			907	613	1,009	2,455

Table C.8-17. Terminal, light crude (ES-Pipe-12k-1c), worst case run to California mainland: Area oiled per biological province in Table C.8-4.

El Segundo Province	Fraction of total oiled area	Water Area Oiled (km ²)
1	0.10	322
2	0.10	330
3	0.00	0
4	0.00	0
5	0.00	0
6	0.15	491
7	0.05	160
8	0.45	1,435
9	0.14	459
10	0.00	0
All	1.00	3,197

Table C.8-18. Terminal, light crude (ES-Pipe-12k-1c), worst case run to California mainland: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) to wading birds, shorebirds and marine mammals.

Species Group	Number	Equivalent Area* (m ²)	Equivalent Area* (mile ²)
Wading birds	32	1.0	0.0000004
Shorebirds	774	1.0	0.0000004
Cetaceans (dolphins)	1	1.8	0.000001
Pinnipeds (seals)	6	32.8	0.00001
Total	814		

* Area swept by oil of a thickness that would effect wildlife times the probability (<1.0) of the species being on the water surface as the oil passes. Results are total by species groups.

Table C.8-19. Terminal, light crude (ES-Pipe-12k-1c), worst case run to California mainland: Estimated injuries (in number of individuals and in equivalent areas of 100% kill) per season to seabirds and waterfowl. The date of this worst case scenario was in fall.

Species	Probability of Intersecting Oil	Equivalent Area 100% Oiled (km ²)	# Oiled (if in winter)	# Oiled (if in spring)	# Oiled (if in summer)	# Oiled (if in fall)
Sea ducks	0.99	3,165	117	0	0	515
Loons	0.99	3,165	12,050	1,249	12	3,178
Grebes	0.35	1,119	649	92	0	1,196
Small alcids	0.35	1,119	1,720	384	64	128
Cormorants	0.35	1,119	1,575	70	73	554
Gulls	0.05	160	1,227	847	1,935	4,286
Jaegers	0.05	160	11	7	54	23
Kittiwakes	0.05	160	191	11	3	12
Murres	0.35	1,119	2,876	1,057	12	992
Phalaropes	0.99	3,165	865	7,775	4,851	1,506
Shearwaters and fulmars	0.05	160	28	4,863	768	20
Storm-petrels	0.35	1,119	204	12	405	34
Terns	0.05	160	3	2	111	0
Pelicans	0.05	160	34	53	105	175
Total waterfowl and seabirds			21,551	16,422	8,394	12,618

Table C.8-20. Terminal, light crude (ES-Pipe-12k-1c), worst case run to islands along Santa Barbara Channel: Area oiled per biological province in Table C.8-4.

El Segundo Province	Fraction of total oiled area	Water Area Oiled (km ²)
1	0.14	315
2	0.20	464
3	0.00	0
4	0.00	0
5	0.00	0
6	0.03	66
7	0.02	52
8	0.60	1,373
9	0.00	6
10	0.00	0
All	1.00	2,277